THE

AMERICAN GAS-LIGHT JOURNAL.

THE OFFICIAL GAZETTE OF

LIGHT, HEAT, WATER-SUPPLY, AND SEWERAGE.

Rooms—No. 39 Nassau Street, cor. Liberty Street, opposite the Post-Office, New York.

VOL. IV.—No. 82. NEW-YORK, FRIDAY, MAY 15, 1863. $3 PER ANNUM.

GAS-COAL IN HOLLAND.

In a recent number of the JOURNAL we alluded to the fact that a correspondent of the London *Chemical News* described a gas-coal lately discovered in Holland, and which promised to be of some importance for gas-making and other purposes. In a later number of that serial, some additional information on the same subject is given, from which we condense the following:

One hundred parts of the coal carefully distilled, especially with the view of obtaining the largest quantity of tar, gave:

Tar	45.000
Ammoniacal water	0.340
Coke	40.000
Gas	14.660
	100.000

The tar obtained was of a light brown color, and solidified at a temperature of + 10° Reaumur, owing to the paraffin it contained; its specific gravity was ascertained to be 0.845, water being 1.000; this tar, when submitted to a carefully conducted fractional distillation, yielded in 100 parts by weight—

Photogene, or paraffin oil	38.888
Gas, or lubricating oil	30.763
Paraffin	2.369
Creosote	16.869
Residue of distillation	11.111
	100.000

One hundred parts of the coal by weight will therefore yield, when treated most suitably for oils—

Paraffin oil	17.49960
Lubricating oil	13.84335
Paraffin	1.06605
Creosote	7.59105
Coke	40.00000
Gas	14.66000
Ammoniacal liquor	0.34000
Residue of distillation	4.99995
	100.00000

The paraffin oil obtained is quite colorless and clear, gives off an ethereal, not unpleasant, smell; is very fluid, and has a density of 0.825, water being 1.000; it burns in suitable lamps with great brilliancy, without charring the cotton of the wick, nor giving any unpleasant smell. It may be safely applied to remove, as benzol does, dirty fatty marks from woven tissues.

The lubricating oil burns with ease, and without causing inconvenience, in such lamps as are constructed for the purpose of burning huile de schiste, or mineral oil; it is extremely fit for lubricating machinery, and, being a neutral oil, does not cause the oxidation of metals. This oil may be applied with great advantage for the manufacture of gas. The paraffin obtained by Dr. Vohl from this coal is of very good quality, and may be readily purified and applied for the manufacture of candles. The creosote is fit, in all aspects, to be used as a means of preserving timber, &c.

As the coke left only contains 0.637 per cent. of ash, it is an excellent fuel.

As a gas-producing coal, Dr. Vohl found that, treated in the most advantageous manner for that purpose, 1lb. of coal yields 12.5 cubic feet of gas, (at the gas-works of the town of Munster the coal was found to yield 22,000 cubic feet of gas per ton, the gas having a specific gravity of 0.745, air being 1.0), of an illuminating power twice as great as that of the ordinary coal-gas; as the crude gas contains only a very small quantity of sulphuretted hydrogen and other impurities, it is readily purified. According to Dr. Vohl, a coal identical with this Gildenhuis coal is met with near the river Ruhr, and in France on the left bank of the Rhine. With the exception only of the fossil of Argshalt, in Galicia, Vohl states he is not acquainted with any more fit or valuable for making paraffin oil and similar produce.

GAS IN ENGLAND.

The Crystal Palace District Gas Company's report for the past half year states that "the working during the half year being in every way satisfactory, the directors have thought it but just, and in strict accordance with the principles always supported by the shareholders, that the consumers should participate in the success of the company; they have, therefore, made a reduction in the price of gas throughout the district, the reduction commencing from the 1st of January, 1863." The profits for the half year are £3,180 18s. 10d., which, together with £467 7s. 9d., the balance brought forward from last account, makes the available balance £3,648 6s. 7d. Out of this sum the directors recommend the declaration of a dividend after the rate of six per cent. per annum on the preference capital; and a dividend after the rate of ten per cent. per annum on the ordinary capital of the company; both free of income tax. The balance of £428 16s. 2d. to be carried forward to the profit of the succeeding year.

At Boston the gas company's directors propose a dividend at the rate of 8½ per cent. for the current year.—*London Builder.*

The Abergavenny Gas-Light Company have concluded to reduce the price of their gas from 6s. 10d. to 5s 10d. per thousand cubic feet. A further reduction of 10d. is also to be made for prompt payment.

At Howden the Gas Company have reduced their price from 7s. 6d to 6s. 8d. and have also declared a dividend of 6 per cent.

The Bromley Gas Company have declared a dividend of 10 per cent., leaving a balance of £305.

The consumption of the Kettering Gas Company is increasing to such an extent, that they have found it necessary to erect a third gas-holder. This is to be built by Messrs. C. & W. Walker for £444.

At Oxford, the price of gas has been reduced to four shillings per thousand cubic feet. This arrangement went into effect March 25th.

At Bilston, the gas company recently treated their workmen to a substantial dinner. After the dinner, the workmen presented a silver cup to Mr. Mudie, the engineer, as a testimonial of their regard.

At Horsham, the price of gas has been reduced from five shillings ten-pence to five shillings per thousand cubic feet.

At Tunbridge Wells, the gas company have reduced the price of gas from five shillings ten-pence to five shillings five-pence per thousand cubic feet.

The London *Builder* comes to us freighted to us with information of English gas companies, from which we learn that the Sheffield United Gas-Light Company have announced a reduction of the price of gas from 3s. 9d. to 3s. 6. per thousand cubic feet—a reduction which also involves the payment of a dividend of 10 instead of 8 per cent. The report of this company also announced a reduction of 4s. per lamp per year in the charge for public lamps, and a proportionate reduction in the charge for meters. The chairman, in moving the adoption of the report, expressed his confidence that the company would be able to continue the reduced prices and still pay the maximum dividend of 10 per cent. Mr. Alderman Holland congratulated the shareholders and gas consumers on the prosperity of the company, and the wise reductions, and hoped that increased prosperity would enable the company to make still further reductions at no very distant period. Alderman Unwin explained that, at the present rate of consumption, the directors would have to draw upon their reserve fund of £16,000 to the extent of nearly £4,000 a year, to enable them to pay the maximum dividend. He, however, anticipated a gradual increase of income from increased consumption. The company was very prosperous, and it would be for the benefit both of the shareholders and the public to let it go quietly on. A dividend of 10 per cent. on the A, and 8 per cent. on the B and other stock was then declared. This is something like intelligent management, says the *Builder*, and so say we.

At Wolverhampton, the Gas Committee of the town have presented a report to the Town Council, in which the following remarks occur: "The company charge the corporation with a consumption of 18,000 cubic feet of gas for each annual lamp. This calculation is made on the basis of the original contract to supply five cubic feet per hour for 3,600 hours For the lamps which are burned only eight months in the year, 14,000 cubic feet of gas is charged for 2,800 hours. A reference to the following towns will show that the charges paid for lighting the lamps are considerably less than Wolverhampton: for while in Wolverhampton the price is £3 12s. 6d., it is in Ashton-under-Lyne £1 4s. 1d.; Bath, £3; Birmingham, £3 10s.; Blackburn, £2 2s. 9d.; Bolton, £1 8s. 3d.; Bradford, £2 8s.; Bury, £1 8s. 2d.; Coventry, £2 10s.; Derby, £2 6s. 2d.; Oldham, £1 15s.; Preston, £2 16s. 7d.; Rochedale, £1 10s.; Salford, £2 0s. 2d.; Dudley, £3; Huddersfield, £1 9s. 6d.; Leeds, £2 5s.; Macclesfield, £2 2s.; Sunderland, £2 15s. 6d.; Stockport, £3; Warrington, £2 14s."

GAS IN CHILI.—An opposition gas company has been organized in Valparaiso, and a sharp competition is now going on between this and the old company. The new corporation is known as the Consumers' Gas Company, and the effect of its going into operation, has been a material reduction in price. The old company formerly charged five dollars per thousand cubic feet. In the district where the new company's pipes are laid, the price has been reduced by the old company to three dollars per thousand, while in that part of the city where the old company still has a monopoly, the price is four dollars. This silly arrangement will, doubtless, be the means of opening the eyes of the people of Valparaiso to the value of the opposition company, and they will cherish it as the people of Brooklyn cherished and fostered the Citizens' Gas Company of that city. These sliding scales of prices will not do. They outrage the common sense of consumers wherever perpetrated, and the companies daring to impose them deserve a severe rebuke at the hands of the community.

WATER-WORKS IN BUENOS AYRES.—The citizens of Buenos Ayres, South America, are agitating the subject of constructing water-works. The municipality have resolved to advertise for plans from English engineers, and have offered a prize of £400 for the best.

The plans are to be sent in on or before the first of August next.

GAS-LIGHT COMPANIES IN THE UNITED STATES.

Compiled from official sources expressly for the AMERICAN GAS-LIGHT JOURNAL.

CORRECTED BY JOHN B. MURRAY, No. 39 NASSAU STREET, NEW YORK, DEALER IN GAS-LIGHT SHARES.

No.	Chartered.	Town.	State.	Chartered Capital.	Par Val. Per Sh. $	Semi-Ann'l Div'd.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Asked pr. cent.	Offered pr. cent.	REMARKS.
1	1857	AURIAN	Mich.	50,000	50	—	May & November.	4,000	3 50	....	....	
2	1856	AKRON	O.	20,000	33⅓	—	Do	3 500	3 00	...	....	
3	1845	ALBANY	N. Y.	25 .0.0	25	4	January & July.	65,000	3 00	120	....	None in market.
4	1858	ALBION	N. Y.	30,000	100	—	Do.	3,000	3 50	....	....	
5	1851	ALEXANDRIA	Va.	105,?30	—	—	City Works.	9,000	3 50	....	....	
6	1852	ALLEGHANY	Pa.	200.000	25	4	May & November.	25,000	3 50	....	....	
7	1853	ALLENTOWN	Pa.	60,000	100	3½	Do.	5,000	3 50	....	....	
8	1857	ALTON	Ill.	75,000	—	—	Private Works.	4,000	3 50	....	....	
9	1850	ALTOONA	Pa.	40,000	20	4	January & July.	5,000	3 00	....	....	
10	1859	AMESBURY AND SALISBURY	Mass.	30,000	25	—	Do.	7,000	4 00	....	....	
11	1858	ANNAPOLIS	Md.	100,000	25	—	Do.	4,000	4 00	....	....	
12	1858	ANN ARBOR	Mich.	23,000	50	5	March & September.	5,500	4 00	....	....	
13	1858	ASTORIA	N. Y.	20,000	50	—	Do.	6 000	4 00	....	....	
14	1855	ATLANTA	Ga.	50,000	25	5	January & July.	12,000	5 00	....	....	
15	1857	ATTLEBORO'	Mass.	6,000	50	3	Do.	2,000	6 00	....	....	
16	1850	AUBURN	N. Y.	80,000	50	5	Do.	10,000	7 00	....	....	
17	1851	AUGUSTA	Ga.	80,000	25	8	Do.	9,000	6 00	....	....	
18	1853	AUGUSTA AND HALLOWELL	Me.	84,700	50	5	Do.	10,000	4 00	....	....	
19	1860	AURORA	Ind.	10,000	—	—	Private Works.	3 500	3 50	....	....	
20	1817	BALTIMORE	Md.	550,000	100	5	June & December.	170.000	2 50	150	....	None for sale.
1	1852	BANGOR	Me.	120,000	100	4	January & July.	12 000	3 50	....	....	
2	1855	BATAVIA	N. Y.	32,000	20	4	Do.	2,500	4 00	....	....	
3	1853	BATH	Me.	65 000	100	3	April & October.	10 000	3 75	....	....	
4	1859	BATH	N. Y.	15.000	50	—	May & November.	3,000	7 00	....	....	
5	1861	BATTLE CREEK	Mich.	15,000	—	—	January & July.			....	....	
6	1858	BELFAST	Me.	14,?00	100	—	Do.	7 000	7 00	....	....	
7	1856	BELLEFONT	Pa.	20,000	25	2	Do.	8,500	4 00	....	....	
8		BELOIT	Wis.	30,000	—	—	Do.	4,000	4 00	....	....	
9	1854	BETHLEHEM	Pa.	50,000	50	4	June & December.	2,000	3 20	...	....	
30	1-59	BEVERLY	Mass.	40,000	100	—	January & July.	4,000	4 00	....	....	
1	1856	BINGHAMTON	N. Y.	50,000	50	3½	Do.	10 000	4 00	....	....	
2	1859	BIRMINGHAM	Pa.	40,000	50	—	Do.	4,000	4 00	....	....	
3	1855	BLOOMINGTON	Ill.	40,000	50	—	Do.	6 000	4 00	...	....	
4	1858	BORDENTOWN	N. J.	50,000	25	3	June & December.	4,000	3 80	....	....	
5	1822	BOSTON	Mass.	1,000,000	500	5	Do.	130,000	2 25	....	....	
6	1859	BRATTLEBORO'	Vt.	21 000	—	—	Do.	3.000	4 00	....	....	
7	1851	BRIDGEPORT	Ct.	90 000	25	4	January & July.	10,000	4 00	90	....	Passed last dividend.
8	1857	BRIDGETON	N. J.	50,000	20	—	Do.	5,000	4 00	....	....	
9	1856	BRISTOL	Pa.	40,000	25	3	February & August.	3.000	4 00	....	....	
40	1855	BRISTOL	R. I.	25 000	50	2	January & July.	6.000	4 00	....	....	
1	1859	BROCKPORT	N. Y.	25 000	100	3	Do.	1 500	4 00	....	....	
2	1858	BROOKLINE	Mass.	66,000	100	4	February & August.	3 500	4 00	....	....	
3	1825	BROOKLYN	N. Y.	2,000,000	25	5	January & July.	75,000	2 50	170	160	
4		BROWNSVILLE	Pa				Do.			....	....	
5	1848	BUFFALO	N. Y.	600,000	50	5	Do.	70,000	3 00	140	125	
6	1852	BURLINGTON	N. J.	100 000	25	3	Do.	5,000	4 00	....	....	
7	1853	BURLINGTON	Vt.	75,000	25	2½	Do.	10,000	4 50	....	....	
8	1859	BURLINGTON	Iowa.	65,000	50	—	Do.	8,000	4 00	....	....	
9	1861	CALAIS	Me.	90,000	100	—	Do.	10,000	3 50	....	....	
50	1852	CAMBRIDGE	Mass.	300,000	100	5	February & August.	20.000	3 50	100	97½	
1	1852	CAMDEN	N. J.	300,000	100	3	April & October.	10,000	3 50	....	....	
2	1858	CANANDAIGUA	N. Y.	50,000	50	—	January & July.	3,000	4 00	90	80	
3	1856	CANTON	O.	19,0 0	50	6	March & September.	6,000	3 00	....	....	
4	1853	CAPE ISLAND	N. J.	80,000	100	3	October.	10,000	6 00	....	...	
5	1860	CARBONDALE	Pa.	16,000	25	—	March & September.	5,000	4 00	....	....	
6	1855	CARLISLE	Pa.	30,000	25	—	January & July.	4,000	4 00	....	...	
7	1856	CATASAUQUA	Pa.	15,000	25	5	May & November.	2,000	4 00	....	....	
8	1858	CATSKILL	N. Y.	10.000	—	—	Private Works.	3 000	4 00	....	....	
9	1857	CHAMBERSBURG	Pa.	30,000	25	—	January & July.	3,000	4 00	....	....	
60	1846	CHARLESTON	S. C.	728,800	25	4	Do.	50,000	4 00	....	....	
1	1851	CHARLESTOWN	Mass.	200.000	50	4	Do.	30.000	3 00	105	....	
2	1858	CHARLOTTE	N. C.	14,000	50	10	March & September.	3,500	6 00	....	....	
3	1859	CHARLOTTEVILLE	Vt.	15,000	25	—	Do.	4,000	4 50	....	...	
4	1851	CHELSEA	Mass.	100,000	100	3½	January & July.	8,000	3 50	....	....	
5	1856	CHESTER	Pa.	35,000	25	3	April & October.	4,000	4 00	....	....	
6	1849	CHICAGO	Ill.	1,300,000	25	5	January & July.	100,000	2 50	150	140	Very scarce.
7	1857	CHICOPEE	Mass.	50,000	20	—	Do.		4 00	....	....	
8	1851	CHILLICOTHE	O.	40,000	25	4	Do.	12,000	3 50	....	....	
9	1841	CINCINNATI	O.	1,600.000	100	5	Do.	225,000	2 50	....	....	
70	1859	CITIZENS', BROOKLYN	N. Y.	1,000,000	20	—	Do.	135,000	2 00	127½	122½	
1		CLARKESVILLE	Tenn.	100,000	50	—	Do.	5,000	4 00	....	....	
2	1860	CLAREMONT	N. H.	20 000	100	—	March & September.	3,000	4 00	....	....	
3	1846	CLEVELAND	O.	200,.00	10	5	January & July.	20.000	3 00	....	....	
4	1858	CLINTON	Mass.	30,000	500	5	Do.	3.000	4 00	....	...	
5	1859	CLYDE	N. Y.	10,000	50	4	Do.	2,500	4 00	....	....	
6	1854	COHOES	N. Y.	50,000	20	3½	April & October.	5,000	3 60	....	....	
7	1860	COLD SPRING	N. Y.	30,000	50	—	Do.	3,500	6 00	75	....	$20,000 Stock for sale.
8	1860	COLD WATER	Mich.	25,000	50	5	January & July.	4,000	4 60	....	....	
9	1852	COLUMBIA	Pa.	37,500	25	—	Do.	4,000	3 50	....	....	
80	1852	COLUMBIA	S. C.	44,000	25	4	Do.	6,000	6 00	....	....	
1	1857	COLUMBIA	Cal.	50,000	25	—	Do.	4,500	10 00	....	....	
2	1853	COLUMBUS	Ga.	54,000	25	5	Do.	5,000	7 00	....	....	
3	1850	COLUMBUS	O.	100,000	10	6	Do.	30.000	3 00	....	....	
4	1853	CONCORD	N. H.	50 000	50	5	Do.	8,000	3 50	....	....	
5	1858	COVINGTON AND NEWPORT	Ky.	100,000	50	3½	Do.	28.000	4 00	...	....	
6	1854	CUMBERLAND	Md.	60,000	50	3	Do.	6,000	4 00	....	....	
7	1857	DANBURY	Ct.	50,000	25	4	Do.	2,000	3 75	....	...	
8	1856	DANVILLE	Pa.	30,000	25	—	June & December.	3 000	4 00	....	....	
9	1855	DAVENPORT	Iowa.	56,000	100	—	Do.	6,000	5 00	....	....	
90	1848	DAYTON	O.	50,000	25	5	February & August.	8,000	3 50	....	.. .	
1	1853	DEDHAM	Mass.	40 000	50	—	January & July.	3.000	4 00	....	....	
2	1860	DELAWARE	O.	30,000	25	—	Do.	2,500	3 00	....	....	
3	1849	DETROIT	Mich.	500,000	50	5	Do.	30,000	3 50	160	150	Excellent Stock.
4	1860	DOBBS' FERRY	N. Y.	25,000	—	—	Do.	3,000	4 00	....	....	
5	1854	DORCHESTER	Mass.	150,000	100	—	Do.	14,000	4 00	....	.....	
6	1859	DOVER	Del.	12,000	—	—	Private Works.	2,000	4 00	....	....	
7		DOVER	N. H.				January & July.			....	....	
8	1857	DOYLESTOWN	Pa.	50,000	—	—	Do.	3 000	4 00	....	....	
9	1854	DUBUQUE	Iowa.	100,000	50	—	Do.	17,000	4 50	....	....	
100	1853	EAST BOSTON	Mass.	133,000	25	4	Do.	20,000	3 50	....	145	No transactions.
1	1858	EAST GREENWICH	R. I.	11,200	100	15	Do.	3,000	7 00	....	...	
2	1861	EAST HAMPTON	Mass.	10,000	25	—	Do.	5,000	9 00	....	....	
3	1861	EAST NEW YORK	N. Y.	50,000	50	—	Do.	12,000	3 50	....	....	
4	1857	EASTON	Md.	9,000	10	—	Do.	1,5 0	7 00	....	....	
5	1850	EASTON	Pa.	125,000	50	4	June & December.	6,000	3 60	....	....	
6	1856	EASTPORT	Me.	50,000	55	—	Do.	3,000	4 00	....	....	
7	1855	ELIZABETH	N. J.	100,000	20	4	January & July.	14,000	3 50	....	....	
8		ELLICOTT'S MILLS	Md.	10,000	—	—	Do.	4,000	4 00	....	....	
9	1852	ELMIRA	N. Y.	50,000	25	3½	Do.	5,000	4 00	....	...	
110	1852	ERIE	Pa.	68 000	50	3½	June & December.	10 000	3 00	....	....	
11	1853	EVANSVILLE	Ind.	60,000	50	4	January & July.	12.000	4 00	110	....	A very good Company.
12		EXETER	N. H.	60,000	—	—	Do.	12,000		....	...	
13		FAIR HAVEN	Ct.									
14	1847	FALL RIVER	Mass.	26,000	—	—	Private Works.	12,000	3 50			
15	1859	FAYETTEVILLE	N. C.	25,000	100	6	January & July.	7,000	6 00	....	....	
16		FIFTH WARD (Milwaukee)	Wis.	50,000	25	—	Do.	10,000	4 00	....	...	
17	1857	FISHKILL	N. Y.	10,000	20	—	April & October.	1.500	6 00	....	....	
18	1853	FITCHBURG	Mass.	100,000	50	3	January & July.	5,000	4 00	....	....	
19	1859	FLEMINGTON	N. J.	20,000	—	—	Do.	3,000	4 00	....	....	
120	1855	FLUSHING	N. Y.	50,000	50	1½	March & September.	6.500	4 00	....	....	
21	1858	FORT WAYNE	Ind.	50,000	25	—	Do.	6,000	4 00	....	....	
22	1851	FRANKFORT	Ky.	30,000	—	—	City Works.	5 500	4 50	...	....	
23	1851	FREDERICK CITY	Md.	36,000	100	—	January & July.	5,000	6 70	....	....	
24	1854	FREDERICKSBURG	Va.	72,500	50	5	Do.	4,500	4 00	....	....	
25	1858	FREDONIA (Natural Gas)	N. Y.	10,000	100	—	Do.	2 000	4 00	.....	....	Unlimited supply of Natural Gas.
26	1856	FREEPORT	Ill.	20,000	100	—	May & November.	10,000	4 00	....	....	

GAS-LIGHT COMPANIES IN THE UNITED STATES.—Continued.

Compiled from official sources expressly for the AMERICAN GAS-LIGHT JOURNAL.

CORRECTED BY JOHN B. MURRAY, No. 39 NASSAU STREET, NEW YORK, DEALER IN GAS-LIGHT SHARES.

No.	Chartered	Town.	State.	Chartered Capital.	Par Val. Per Sh. $	Semi-Ann'l Div'd.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Asked pr. cent.	Offered pr. cent.	REMARKS.
127	1859	Fremont	O.	25,000	25	—	May & November.	2,000	4 50	....	....	
28	1858	Fulton	N. Y.	12,000	100	—	Do.	4,000	7 00	....	....	
										....	....	
29	1855	Galena	Ill.	70,000	100	—	Do.	8,000	4 00	....	....	
130	1859	Galion	O.	25,000	25	—	January & July.	1,800	3 00	....	....	
31	1858	Galveston	Texas.	150,000	50	—	May & November.	7,000	6 00	....	....	
32	1854	Gardiner	Me.	100,000	50	4	Do.	8,000	4 00	....	....	
33	1853	Geneva	N. Y.	75,000	25	2½	Do.	6,000	4 00	....	....	
34	1851	Germantown	Pa.	Merged	into	the	Philadelphia Works.	12,000	2 25	....	....	
35	1859	Gettysburg	Pa.	20,000	50	3	January & July.	2,500	4 00	....	....	
36	1854	Glenn's Falls	N. Y.	35,000	50	3	February & August.	4,000	4 00	....	....	
37	1854	Gloucester	Mass.	40,000	50	—	January & July.	5,000	3 50	....	....	
38	1857	Gloversville	N. Y.	15,000	25	—	Do.	3,000	3 50	....	....	
39	1858	Grand Rapids	Mich.	50,000	20	—	Do.	3,000	4 00	....	....	
140	1855	Great Barrington	Mass.	5,000	100	5	April & October.	2,000	7 00	....	....	
41	1849	Great Falls	N. H.	50,000	100	3	Do.	3,000	4 00	....	....	
42	1860	Greenfield	Mass.	20,000	50	2	January & July.	2,500	4 00	....	....	
43	1853	Greenpoint	N. Y.	100,000	50	5	Do.	20,000	3 00	....	....	
44	1859	Greensboro'	N. C.	12,000	50	—	April & October.	3,000	7 00	....	....	
45	1858	Greensburg	Pa.	30,000	25	3	May & November.	2,000	3 00	....	....	
46	1854	Hagerstown	Md.	15,000	20	—	January & July.	2,000	6 00	....	....	
47		Hamilton	O.	15,000			Do.			....	....	
48	1859	Hannibal	Mo.	100,000	100	—	Do.	6,000	3 50	....	....	
49	1857	Harlem	N. Y.	350,000	50	3½	Do.	25,000	3 00	....	145	
150	1855	Harrisburg	Pa.	100,000	—	4	Do.	5,000	4 00	....	....	
51	1849	Hartford	Ct.	200,000	25	4	Do.	25,000	3 00	150	....	We have orders for this Stock.
52		Hastings	N. Y.				Do.	8,000	4 00	....	....	
53	1853	Haverhill	Mass.	50,000	50	—	Do.	5,000	4 00	....	....	
54	1859	Haverstraw	N. Y.	20,000	100	—	Do.	5,000	4 00	....	....	
55	1861	Hayesville	Mass.	15,000	25		Do.	4,000	4 00	....	....	
56	1859	Hempstead	N. Y.	16,000	25	—	Do.	1,000	4 00	....	....	
57	1862	Hoboken	N. J.	100,000	25	3	Do.	30,000	2 50	....	....	Works not yet built.
58	1856	Hollidaysburg	Pa.	30,000	25	2	Do.	4,000	3 50	....	....	
59	1861	Holyoke	Mass.	20,000	25	—	Do.	3,000	4 00	....	....	
160	1861	Homer & Cortlandt	N. Y.	40,000	100	—	Do.	6,000	4 00	....	....	
61	1854	Honesdale	Pa.	30,000	25	3	Do.	2,500	4 00	....	....	
62	1860	Hornellsville	N. Y.	12,000	50	—	Do.	2,000	4 00	....	....	
63	1853	Hudson	N. Y.	50,000	100	3½	February & August.	3,000	4 00	....	....	
64	1857	Huntington	Pa.	18,000	50	3	Do.	2,000	3 50	....	....	
65	1856	Huntsville	Ala.	7,325	25	—	June & December.	2,000	5 00	....	....	
66		Indianapolis	Ind.	150,000	—	—	Do.	15,000	5 00	....	....	
67	1857	Iowa City	Iowa.	40,000	50	—	February & August.	4,000	4 50	....	....	
68	1852	Ithaca	N. Y.	75,000	25	3½	January & July.	6,000	4 00	....	....	
69	1857	Jackson	Mich.	25,000	50	5	Do.	6,000	3 50	....	....	
170		Jackson	Miss.	80,000	50	—	Do.	4,000	4 50	....	....	
71		Jackson	Cal.	50,000	30	—	Do.	4,000	10 00	....	....	
72		Jacksonville	Flor.	30,000	20	—	Do.	2,000	7 00	....	....	
73		Jacksonville	Ind.	50,000	50	—	Do.	4,000	5 00	....	....	
74	1858	Jacksonville	Mo.	25,000	25	—	Do.	7,000	6 00	....	....	
75	1856	Jamaica	N. Y.	20,000	—	4	Do.	6,000	4 00	....	....	
76	1858	Jamaica Plain	Mass.	10,000	100	4	Do.	3,000	4 00	....	....	
77		Jamestown	N. Y.	25,000	—	—	Do.	4,000	4 00	....	....	
78	1856	Janesville	Wis.	50,000	100	—	Do.	12,000	4 00	....	....	
79		Jeffersonville	Md.	30,000	25		Do.	4,000	4 00	....	....	
180	1853	Jersey City	N. J.	300,000	—	5	Do.	30,000	3 00	150	....	No sales since formation of Hoboken Co.
81	1858	Jersey Shore	Pa.	15,000	25	—	Do.	2,000	3 70	....	....	
82	1856	Johnstown	Pa.	80,000	25	3	Do.	8,000	3 00	....	....	
83	1857	Joliet	Ill.	300,000	100	—	June & December.	6,000	4 00	....	....	
84	1858	Kalamazoo	Mich.	30,000	50	5	Do.	10,000	4 00	....	....	
85	1860	Keene	N. H.	60,000	100	—	Do.	4,500	4 00	....	....	
86	1855	Keokuk	Iowa.	100,000	100	—	January & July.	10,000	4 50	....	....	
87	1855	Kingston	Pa.	50,000	50	—	Do.	3,000	4 00	....	....	
88	1859	Kittanning	Pa.	20,000	—	—	Doubtful.	5,000	4 00	....	....	Said to be a fraud.
89	1854	Knoxville	Tenn.	63,000	—	—	April & October.	4,000	5 00	....	....	
190	1860	Laconia	N. H.	20,000	100	—	Do.	4,000	6 00	....	....	
91	1859	La Crosse City	Wis.	100,000	50	—	June & December.	10,000	5 00	....	....	
92	1854	Lafayette	Ind.	60,000	50	4	January & July.	8,000	3 25	....	....	
93	1856	Lambertville	N. J.	30,000	25	—	Do.	2,600	4 00	....	....	
94	1849	Lancaster	Pa.	100,000	50	4	Do.	10,000	3 00	....	....	
95	1856	Lancaster	O.	25,000	100	5	Do.	5,000	3 50	....	....	
96	1855	Lansinburg	N. Y.	25,000	100	—	Private Works.	7,000	4 00	....	....	
97	1849	Lawrence	Mass.	200,000	100	4	February & August.	15,000	3 50	....	....	
98	1859	Leavenworth	Kansas.	200,000	25	—	January & July.	10,000	5 00	....	....	
99	1856	Lebanon	Pa.	26,000	50	—	February & August.	5,000	4 00	....	....	
200	1861	Le Roy	N. Y.	25,000	50	—	Do.	4,000	4 00	....	....	
1	1853	Lewisburg	Pa.	20,000	100	—	January & July.	4,000	4 00	....	....	
2	1856	Lewiston	Me.	100,000	20	3	Do	6,000	4 00	....	....	
3	1856	Lewistown	Pa,	30,000	50	3	April & October.	3,000	3 10	....	....	
4	1853	Lexington	Ky.	100,000	25	4	January & July.	5,000	4 00	....	....	
5	1853	Little Falls	N. Y.	112,000	25	—	Do.	3,500	7 00	....	....	
6	1861	Little Rock	Ark.	20,000	—	—	Do.	5,000	6 00	....	....	
7	1858	Lockhaven	Pa.	28,000	—	—	Do.	3,000	4 00	....	....	
8		Lockport	N. Y.	100,000	50	—	Do.	4,000	4 00	....	....	
9	1838	Louisville	Ky.	600,000	50	6	Do.	80,000	2 50	1 25	....	But $481,400 stock has been sold. This Company has a large contingent fund and undivided profit on hand.
210	1849	Lowell	Mass.	200,000	25	5	Do.	50,000	3 25	....	....	
11	1852	Lynchburg	Va.	70,000	25	5	Do.	6,000	3 80	....	....	
12	1852	Lynn	Mass.	55 000	50	4	Do.	20,000	4 00	....	....	
13	1859	Lyons	N. Y.	30,000	100	—	Do.	4,000	4 00	....	....	
14	1852	Macon	Ga.	75,160	25	6	Do.	5,000	5 00	....	....	
15	1851	Madison	Ind.	160,000	25	3	Do.	10,100	3 50	....	....	
16	1855	Madison	Wis.	100,000	25	—	Do.	5,000	5 00	....	....	
17	1854	Malden & Melrose	Mass.	50,600	25	3	February & August.	5,000	4 00	....	....	
18	1852	Manayunk	Pa.	40,000	100	—	Do.	7,000	4 00	....	....	
19	1852	Manchester	N. H.	100,000	100	5	January & July.	25,600	3 00	....	....	
220	1830	Manhattan (N. Y. City)	N. Y.	4,000,000	50	5	Do.	600,000	2 50	300	375	
21		Mansfield	O.	25,000	—	—	Do.	10,000	4 00	....	....	
22	1854	Marblehead	Mass.	40,000	100	3	Do.	1,000	4 00	....	....	
23		Marlboro'	Mass.	20,000	—	—	Do.	8,000	4 00	....	....	
24		Mauch Chunk	Pa.	50,000	50	—	Do.	7,000	4 00	....	....	
25	1857	Marietta	O.	50,000	50	—	Do.	7,000	4 00	....	....	
26	1858	Marysville	Cal.	50,000	100	—	Do.	4,000	12 50	....	....	
27	1857	Massilon	O.	20,000	25	—	Do.	5,000	3 00	....	....	
28	1855	Meadville	Pa.	39,500	25	—	Do.	4,000	3 50	....	....	
29		Medina	N. Y.	2,000	100	—	Do.	2,000	7 00	....	....	
230	1852	Memphis	Tenn.	300,000	100	5	June & December.	12,000	3 50	....	....	
31		Meriden	Ct.	20,000			Do.			....	....	
32	1859	Metropolitan (N. Y. City)	N. Y.	1,000,000	100	—	January & July.	200,000	2 50	....	....	
33	1859	Middleboro'	Mass.	15,000	—	—	Private Works.		6 00	....	....	
34	1853	Middletown	Ct.	50,000	25	3	March & September.	5,000	3 80	....	....	
35		Middletown	N. Y.	10,000	25	—	Do.			....	....	
36		Milford	Mass.	20,000	—	—	Do.		4 00	....	....	
37		Milledgeville	Ga.	100,000	50	—	Do.		5 00	....	....	
38		Milton	Pa.	10,000			Do.			....	....	
39	1847	Milwaukee	Wis.	400,000	50	5	January & July.	24,000	3 50	....	....	
240	1852	Mobile	Ala.	200,000	—	—	Do.	30,000	4 50	....	....	
41	1836	Monroe	Mich.	40,000	50	—	Do.	5,000	3 50	....	....	
42	1852	Montgomery	Ala.	100,000	25	4	February & August.	7,000	6 00	....	....	
43	1856	Montpelier	Vt.	30 000	25	3	January & July.	5,000	4 50	....	....	
44	1859	Morrisania	N. Y.	30,000	50	—	Do.		4 00	....	....	
45	1859	Morristown	N. J.	18,000	50	—	Do.	3,500	4 00	....	....	
46	1854	Mount Holly	N. J.	16,650	25	3	April & October.	2,000	7 00	....	....	
47		Mount Vernon	O.	50,000	100	—	Do.		4 00	....	....	
48	1857	Muscatine	Iowa.	50,000	100	—	January & July.	3,000	4 50	....	....	
49	1854	Nantucket	Mass.	50,000	100	3	February & August.	6,000	4 00	....	....	

GAS-LIGHT COMPANIES IN THE UNITED STATES.—Continued.

Compiled from official sources expressly for the AMERICAN GAS-LIGHT JOURNAL.

CORRECTED BY JOHN B. MURRAY, No. 39 NASSAU STREET, NEW YORK, DEALER IN GAS-LIGHT SHARES.

No.	Chartered.	Town.	State.	Chartered Capital.	Par Val. per Sh. $	Semi-Ann'l Div.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Asked pr. cent.	Offered pr. cent.	REMARKS.
250	1852	Nashua	N. H.	45,000	50	3½	January & July.	10,000	3 50	....	....	
51	1850	Nashville	Tenn.	260,000	50	5	Do.	25,000	3 50	....	....	
52	1858	Natchez	Miss.	46,000	50	—	Do.	20,000	5 00	....	....	
53	1852	New Albany	Ind.	200,000	50	3½	Do.	16,000	3 50	....	....	
54	1846	Newark	N. J.	362,000	50	5	Do.	45,000	3 62	130	....	Always a favorite stock.
55	1856	Newark	O.	30,000	100	—	Do.	7,000	5 40	....	....	
56	1852	New Bedford	Mass.	130,000	100	5	Do.	15,000	2 90	102	....	Well managed and kept quiet.
57	1859	Newbern	N. C.	22,000	100	6	Do.	6,000	3 50	....	....	
58		New Britain	Ct.	30,000	20	5	Do.	3,000	4 00	....	....	
59	1851	New Brunswick	N. J.	100,000	20	4	Do.	8,000	3 00	115	....	
260	1852	Newburg	N. Y.	67,000	20	4	Do.	10,000	4 00	105	....	
61	1852	Newburyport	Mass.	150,000	10	4	Do.	9,000	4 00	92½	....	
62	1857	Newcastle	Del.	32,300	10	3	Do.	4,000	4 00	90	....	
63	1847	New Haven	Ct.	250,000	25	4	Do.	30,000	3 00	155	....	
64	1853	New London	Ct.	70,000	50	3	Do.	12,000	4 00	105	....	
65	1835	New Orleans	La.	1,500,000	100	6	Do.	120,000	4 50	180	....	
66	1853	Newport	R. I.	130,200	100	4	Do.	10,000	3 50	112	....	
67	1854	Newton & Watertown	Mass.	300,000	100	2	Do.	10,000	4 00	....	....	
68		Newton	N. J.	30,000	—	—	Do.	3,000	4 00	....	....	
69		Newton	Pa.	20,000	50	—	Do.	2,500	4 00	....	....	
270	1823	New York	N. Y.	1,000,000	50	5	May & November.	100,000	2 50	300	....	
71	1859	Niagara Falls	N. Y.	15,000	25	—	Do.	3,000	4 00	90	....	
72		Norfolk	Va.	60,000	25	—	Do.	40,000	4 00	....	....	
73	1853	Norristown	Pa.	41,700	25	4	June & December.	8,000	3 50	....	....	
74	1855	North Attleboro'	Mass.	50,000	100	3	Do.	6,000	4 00	....	....	
75		Northern Liberties	Pa.	400,000	25	7½	City Works.	40,000	2 50	....	....	
76		North Adams	Mass.	25,000	—	—	March & September.	30,000	4 00	....	....	
77	1856	Northampton	Mass.	85,000	25	3	January & July.	4,500	4 00	....	....	
78	1859	North Bridgewater	Mass.	16,000	100	4	June & December.	1,000	7 00	....	....	
79	1856	Norwalk	Ct.	30,000	150	4	February & August.	6,000	4 00	....	....	
80	1859	Norwalk	O.	30,000	25	—	January & July.	4,000	4 00	....	....	
281	1854	Norwich	Ct.	75,000	25	3½	Do.	12,000	3 50	....	....	
82	1861	Norwich	N. Y.	12,000	50	—	Do.	2,500	4 00	....	....	
83	1859	Nyack	N. Y.	20,000	100	—	Do.	2,500	4 00	....	....	
84	1860	Oberlin	O.	10,000	—	—	Do.	1,200	4 00	....	....	
85	1855	Ogdensburg	N. Y.	75,000	50	5	Do.	9,000	4 00	....	....	
86	1859	Orange	N. J.	65,000	25	—	Do.	6,000	3 50	....	....	
87	1852	Oswego	N. Y.	81,250	100	3½	Do.	15,000	4 00	105	....	Good works, built by Hoy, Jr., & Kennedy.
88	1855	Ottawa	Ill.	45,000	100	6½	Do.	6,000	4 00	....	....	
89	1856	Owego	N. Y.	40,000	50	3½	Do.	5,000	4 00	....	....	
290	1860	Owensboro'	Ky.	25,000	25	—	Do.	4,000	3 50	....	....	
91	1856	Paducah	Ky.	75,000	100	—	May & November.	4,000	5 00	....	....	
92	1861	Painsville	O.	40,000	25	5	Do.	2,500	5 00	....	....	
93	1856	Palmyra	N. Y.	12,000	25	—	January & July.	3,000	7 00	....	....	
94	1847	Paterson	N. J.	125,000	25	3	Do.	15,000	3 50	95	....	
95	1850	Pawtucket	R. I.	75,000	50	4	Do.	12 000	3 00	....	....	
96	1855	Peekskill	N. Y.	31,000	50	3	June & December.	4,000	4 00	....	....	
97	1860	Penn Yan	N. Y.	12,000	50	5	Do.	3,000	4 00	....	....	
98	1859	Peoples', Chicago	Ill.	500,000	50	New	Do.	100,000	2 50	....	....	What is this Company doing?
99	1855	Peoria	Ill.	100,000	50	4	Do.	8,000	3 50	....	....	
300	1852	Petersburg	Va.	120,000	—	5	January & July.	20,000	3 80	....	....	
1	1841	Philadelphia	Pa.	3,000,000	50	—	City Works.	650,000	2 25	....	....	
2	1855	Piqua	O.	50,000	50	—	January & July.	6,500	4 00	....	....	
3	1835	Pittsburg	Pa.	300,000	100	5	Do.	60,000	1 50	115	....	
4	1854	Pittsfield	Mass.	50,000	100	5	Do.	4,500	4 00	....	....	
5	1858	Placerville	Cal	30,000	50	—	Do.	4,500	10 00	....	....	
6	1860	Plainfield	N. J.	25,000	50	—	Do.	2,500	4 00	....	....	
7	1859	Plattsburg	N. Y.	16,000	50	—	January & July.	5,000	7 00	....	....	
8	1853	Plymouth	Mass.	40,000	100	—	April & October.	8,000	4 00	....	....	
9	1860	Port Chester	N. Y.	50,000	50	—	Do.	4,000	4 00	....	....	
310	1860	Port Jervis	N. Y.	20,000	100	—	Do.	3,000	4 10	....	....	
11	1849	Portland	Me.	300,000	50	4	January & July.	30,000	3 00	....	....	
12	1859	Portland	Oreg.	50,000	50	—	Do.	3,500	8 00	....	....	
13	1859	Port Lavacca	Texas.	50,000	100	—	Do.	2,500	7 00	....	....	
14	1851	Portsmouth	N. H.	70,000	100	8	April & October.	6,500	3 70	....	....	
15	1855	Portsmouth	O.	50,000	50	4	January & July.	10,000	3 50	....	....	
16	1855	Portsmouth	Va.	100,000	50	4	Do.	4,000	4 00	....	....	
17	1856	Pottstown	Pa.	20,000	50	3	Do.	3,500	4 00	....	....	
18	1850	Pottsville	Pa.	110,000	50	2	Do.	10,000	3 50	....	....	
19	1850	Poughkeepsie	N. Y.	84,000	25	4	March & September.	15,000	3 50	130	....	
320	1848	Providence	R. I.	1,000,000	50	4	January & July.	60,000	3 00	122	....	
21	1858	Quincy	Ill.	300,000	50	4	June & December.	12,000	3 50	....	....	
22		Quincy	Mass.	00,000	00	—	Do.	00,000	0 00	....	....	
23	1855	Racine	Wis.	43,500	26	—	Do.	7,000	3 50	....	....	
24	1857	Rahway	N. J.	50,000	20	—	January & July.	5,000	4 00	....	....	
25	1858	Raleigh	N. C.	25,000	100	6	May & Novrmber.	5,000	6 00	....	....	
26	1848	Reading	Pa.	100,000	25	4	January & July.	25,000	3 00	....	....	
27	1851	Richmond	Va.	341,975	—	—	City Works.	30,000	3 00	....	....	Jeff. Davis has extinguished the gas-lights of Richmond, Va.
28	1859	Richmond	Mass.	40,000	25	—	January & July.	3,000	4 00	....	....	
29	1859	Ripley	O.	30,000	50	—	Do	2,000	4 50	....	....	
330	1852	Rochester	N. Y.	200,000	50	5	Do.	50,000	2 50	....	....	
31	1857	Rockford	Ill.	40,000	50	—	Do.	4,000	4 00	....	....	
32	1854	Rock Island	Ill.	100,000	50	—	Do.	6,000	4 50	....	....	
33	1854	Rockland	Me.	50,000	100	—	Do.	6,000	4 40	....	....	
34	1852	Rome	N. Y.	35,000	100	3½	Do.	10,000	3 60	....	....	
35	1854	Rondout and Kingston	N. Y.	65,150	20	3½	June & December.	10,000	3 80	....	....	
36	1854	Roxbury	Mass.	150,000	100	5	January & July.	20,000	3 50	....	....	
37	1859	Rutland	Vt.	20,000	25	—	Do.	4,000	3 50	....	....	
38		Saco	Me.	71,600	100	3½	April & October.	8,000	4 00	....	....	
39	1857	Sacramento	Cal.	500,000	100	—	Do.	40,000	10 00	....	....	
340	1859	Sag Harbor	N. Y.	20,000	—	—	Do.	4,000	4 00	....	....	
41	1858	Saint Albans	Vt.	15,000	20	—	Do.	3,000	7 00	....	....	
42		Saint Johnsbury	Vt.	30,000	25	—	Do.	4,000	4 00	....	....	
43	1857	Saint Joseph	Mo.	50,000	100	5	January & July.	6,000	5 00	....	....	
44	1859	Saint Louis	Mo.	600 000	50	—	June & December.	180,000	3 50	....	....	
45	1857	Saint Paul	Min.	200,000	50	3	January & July.	10,000	6 00	....	....	
46	1856	Salem	N. J.	30,000	25	3	Do.	5,000	3 86	....	....	
47	1850	Salem	Mass.	200,000	100	4	February & August.	30,000	3 24	....	....	
48	1859	Salem	O.	25,000	20	—	Do.	3,000	3 00	....	....	
49	1859	Salisbury	N. C.	14,600	50	6	May & November.	3,500	6 00	....	....	
350		Salisbury Mills	Mass.	1,250	25	—	Do.	3,000	4 00	....	....	
51		Salmon Falls	Me.	25,000	100	—	Do.	3,000	4 00	....	....	
52		San Antonio	Texas.	75,000	20	—	Do.	40,000	6 00	....	....	
53		San Diego	Cal.	30,000	50	—	Do.	50 000	10 00	....	....	
54	1854	Sandusky	O.	75,000	50	—	April & October.	9,000	3 00	....	....	
55	1859	Sandwich	Mass.	10,000	—	—	Private Works.	2,000	3 50	....	....	
56	1852	San Francisco	Cal.	1,000 000	100	6	Do.	200,000	8 00	110	....	
57	1853	Saratoga Springs	N. Y.	39,000	100	—	January & July.	6,000	3 60	70	....	
58		Saugerties	N. Y.	30,000	20	—	Do.	4,000	3 00	....	....	
59	1849	Savannah	Ga.	200,000	25	5	Do.	10 000	3 75	....	....	
360	1851	Schenectady	N. Y.	50,000	—	—	Private Works.	11,000	4 00	....	....	
61	1858	Scranton, Gas and Water	Pa.	100,000	25	—	January & July.	6,000	3 80	....	....	
62	1857	Selma	Ala.	20,000	100	—	Do.	2,000	5 00	....	....	
63	1856	Seneca Falls	N. Y.	80,000	50	2	Do.	6,000	4 00	....	....	
64		Shreveport	La.	40,000	25	—	Do.	3,000	0 50	....	....	
65	1856	Sing Sing	N. Y.	40,000	100	—	Do.	3,000	4 00	....	....	
66		Smyrna	Del.						4 00	....	....	
67	1860	South Adams	Mass.	10,000	25	—	Do.	3,000	4 00	....	....	
68	1859	South Bridge	Mass.	5,000	25	—	Do.	4,010	6 00	....	....	
69		South Boston	Mass.	200,000	50	—	Do.	60,000	3 25	110	....	
370		Springfield	O.	200,000	100	—	Do	20,000	3 50	....	....	
71	1854	Springfield	Ill.	75,000	50	—	January & July.	10,000	3 50	....	....	
72	1848	Springfield	Mass.	100,000	500	5	February & August.	10,000	3 60	140	....	
73	1855	Stamford	Ct.	6,250	25	5	April & October.	3,000	3 50	....	....	
74	1857	Staten Island	N. Y.	159,000	50	5	January & July.	26,000	4 00	95	....	

GAS-LIGHT COMPANIES IN THE UNITED STATES.—Continued.

Compiled from official sources expressly for the AMERICAN GAS-LIGHT JOURNAL.

CORRECTED BY JOHN B. MURRAY, No. 39 NASSAU STREET, NEW YORK, DEALER IN GAS-LIGHT SHARES.

No.	Chartered.	Town.	State.	Chartered Capital.	Par Val. per Sh. $	Semi-Ann'l Div'd.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Asked pr. cent.	Offered pr. cent.	REMARKS.
375	1859	Staunton	Va.	18,000	50	6	January & July.	4,000	7 00	....	....	
76		Steubenville	O.	150,000	100	—	Do.	15,000	4 00	....	....	
77		Stockton	Cal.	50,000	—	—	Do.	8 000	10 00	....	....	
78	1848	Syracuse	N. Y.	125,000	25	5	March & September.	25,000	3 00	112	....	
79		Tamaqua	Pa.	40,000	25	—	Do.	3 000	4 00	....	....	
380	1859	Tarrytown and Irvington	N. Y.	70,000	50	—	January & July.	3,000	4 00	....	....	
81	1853	Taunton	Mass.	100,000	50	4	Do.	10,000	4 00	....	....	
82		Terre Haute	Ind.	100,000	100	—	Do.	3,000	4 00	....	....	
83		Thompsonville	Ct.	25,000	50	—	Do.	4,000	4 50	....	....	
84		Tiffin	O.	25,000	20	—	Do.	4,000	4 00	....	....	
85	1853	Toledo	O.	100,000	50	3	Do.	8,000	3 50	....	....	
86	1847	Trenton	N. J.	100,000	20	4	Do.	15,000	3 60	....	110	
87	1848	Troy	N. Y.	200,000	100	4	June & December.	35,000	3 60	160	....	
88	1856	Urbana	O.	30,000	25	—	April & October.	3,500	4 00	....	....	
89	1849	Utica	N. Y.	80,000	100	4	Do.	22,000	3 60	....	....	
390	1853	Vicksburg	Miss.	66,000	50	—	March & September.	4,000	4 50	....	....	
91	1859	Vincennes	Ind.	25,000	100	—	January & July.	2,000	4 00	....	....	
92	1858	Walden	N. Y.	2,500	—	—	Private Works.	1,000	6 00	....	....	
93	1853	Waltham	Mass.	100,000	100	4	January & July.	3,000	4 00	....	....	
94	1857	Ware	Mass.	30,000	20	—	Do.	3,500	4 00	....	....	
95	1861	Warren	O.	30,000	50	—	Do.	4,000	3 00	....	....	
96	1854	Warren	R. I.	20,000	25	—	Do.	3,000	4 00	....	....	
97	1855	Washington	D. C.	500,000	20	5	Do.	50,000	3 25	150	148	
98	1859	Washington	N. C.	15 000	100	—	April & October.	1,500	6 00	....	....	
99	1848	Washington	Pa.	20,000	25	4	January & July.	4,000	3 00	....	....	
400	1854	Waterbury	Ct.	100,000	25	—	Do.	4,000	4 00	....	....	
1	1852	Waterford	N. Y.	12,000	25	—	Do.	4,000	4 00	....	....	
2	1852	Watertown	N. Y.	20,000	100	—	Do.	10,000	7 00	....	....	
3	1856	Watertown	Wis.	25,000	100	—	Do.	5,000	5 00	....	....	
4	1858	Wautoma	Wis.	30,000	50	—	Do.	3,000	4 50	....	....	
5	1857	Waverly	Miss.	20,000	100	—	April & October.	4,000	5 00	....	....	
6	1854	West Cambridge	Mass.	60,000	100	—	February & August.	10 000	4 00	....	....	
7	1852	Westchester	Pa.	100,000	25	2½	Do.	3,500	3 50	....	....	
8		Westfield	Mass.	25,000	100	6	Do.	4,000	4 00	....	....	
9		Weston	O.			—				....	....	
410	1857	West Point	N. Y.	50,000	—	—	United States Military	Academy.		2 00	....	....
11	1858	West Troy	N. Y.	100,000	50	3	January & July.	10,000	3 60	....	....	
12	1850	Wheeling	Va.	75,000	25	6	Do.	12,000	2 70	....	....	
13		White Plains	N. Y.			—	Do.			....	....	
14	1856	Wilkesbarre	Pa.	50,000	50	—	May & November.	4,000	3 80	....	....	
15	1850	Williamsburg	N. Y.	500,000	50	5	January & July.	60,000	3 50	....	....	
16	1858	Williamsburg	Va.	30.000	25	—	Do.	3,000	4 00	....	....	Camp-fires of the Union Army light up this place at present.
17	1857	Williamsport	Pa.	70.000	25	4	Do.	3,500	3 80	....	....	
18	1859	Willimantic	Ct.	12,000	—	—	Do.	2,500	3 50	....	....	
19	1853	Wilmington	N. C.	60,000	50	5	Do.	8,000	5 00	....	....	
420	1852	Wilmington	Del.	200,000	50	5	February & August.	20.000	3 00	....	....	
21	1854	Winchester	Va.	36,000	50	6	January & July.	5,000	4 00	....	....	
22		Woburn	Mass.	20,000	—	—	Do.	3,000	4 00	....	....	
23	1856	Woodstock	Vt.	10,000	50	4	Do.	4,000	6 00	....	....	
24	1853	Woonsocket	R. I.	82,600	100	4	April & October.	4,000	3 50	....	....	
25	1856	Wooster	O.	25,000	50	—	January & July.	6 000	3 00	....	....	
26	1849	Worcester	Mass.	160,000	100	5	Do.	15,000	3 50	....	....	
27	1855	Xenia	O.	40,000	50	—	Do.	3,000	4 00	....	....	
28	1854	Yonkers	N. Y.	75,000	50	3½	Do.	6,500	4 00	102½	....	
29	1849	York	Pa.	40,000	57	3	June & December.	10,000	3 50	....	....	
430		Yorkville	S. C.	20 000	25	—	Do.	4,000	4 00	....	....	
31	1858	Ypsilanti	Mich.	20,000	50	5	February & August.	6,000	4 00	....	....	
32	1850	Yreka	Cal.	30,000	100	—	Do.	2,000	10 00	....	....	
33	1848	Zanesville	O.	44,600	25	4	Do.	10,000	3 50	....	....	

GAS-LIGHT COMPANIES IN THE BRITISH PROVINCES OF NORTH AMERICA.

No.	Chartered.	Town.	Province	Chartered Capital.	Par Val. per Sh. $	Semi-An'l Div'd.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Asked pr. cent.	Offered pr. cent.	REMARKS.
1	1854	Belleville	C. W.	33 040	100	4	January & July.	1,200	5 00	....	....	
2	1854	Brantford	C. W.	32,000	100	2½	Do.			....	....	
3		Brockville	C. W.	50,000	—	—	Do.	5,000	4 00	....	....	
4		Chatham	N. B.	50,000	—	—				....	....	
5	1854	Charlotte Town	P. E. I.	50,000	100	5	Do.	8,000	3 50	....	....	
5	1857	Cobourg	C. W.	30,000	—	—	February & August.	4,000		....	....	
7		Dundas	C. W.	30,000	—	—	Do.	6,000	4 00	....	....	
8		Frederick	N. B.	50,000	—	—	Do.			....	....	
9	1843	Halifax	N. S.	160,000	40	7	May.	30,000	3 00	....	....	
10	1850	Hamilton	C. W.	125,000	40	5	March & September.	20,000	3 50	....	....	
11	1848	Kingston	C. W.	80,000	100	—	Do.	6,000	3 50	....	....	
12	1853	London	C. W.	100,000	20	5	May & November.	5,000	5 00	....	....	
13	1847	Montreal	C. E.	360,000	40	—	March & September.	80,000	3 00	....	....	
14	1854	Ottawa	C. W.	40 000	40	5	Do.	5,000	4 50	....	....	
15	1859	Point Levi	C. E.	25,000	25	—	January & July.	4,000	3 50	....	....	
16	1859	Port Hope	C. W.	28,000	20	4	May & November.	4,500	3 50	....	....	
17	1847	Quebec	C. E.	200,000	200	4	January & July.	60,000	3 00	....	....	
18	1848	Saint Catherine's	C. W.	80,000	20	—	May & November.	7,000	4 50	....	....	
19	1859	Saint Hyacinthe	C. E.	15.000	20	—	Do.	4,000	4 00	....	....	
20		Saint John	N. B.	170,000	80	—	June & December.	25,000	3 50	....	....	
21		Saint John's	N. F.	50,000	—	4	Do.	30,000		....	....	
22	1853	Sorel	C. E.	14,000	20	4	Do.	4,000	3 00	....	....	
23	1848	Toronto	C. W.	400,000	100	4	February & August.	50,000	3 33⅓	....	....	

GAS-LIGHT COMPANIES IN CUBA, MEXICO, SOUTH AMERICA AND NEW ZEALAND.

No.	Chartered.	Town.	State.	Chartered Capital.	Par Val. per Sh. $	Semi-An'l Div'd.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Asked pr. cent.	Offered pr. cent.	REMARKS.
1		Callao	Chile.		—	—	January & July.	20,000	7 00	....	....	
2		Cardenas	Cuba.	50,000	—	—	Do.	180,000	5 00	....	....	
3	1857	Compania Cubana	Hav'a	500,000	500	10	Do.			....	....	
4		Cienfuegos	Cuba.		—	—	Do.	12,000	5 00	....	....	These four towns are lighted by the Compania Cubana of Havana.
5		Guanabacoa	Cuba.		—	—	Do.	14,000	5 50	....	....	
6		Regla	Cuba.		—	—	Do.	10,000	5 00	....	....	
7		Trinidad	Cuba.		—	—	Do.	16,000	5 00	....	....	
8		Guyaquil	S. A.	150,000	—	—	Do.	35,000		....	....	
9		Havana	Cuba.	1,250,000	500	7½	Do.	300,000	5 00	....	....	
10		Lima	Peru.	100,000	—	—	Do.	150,000		....	....	
11		Maranham (Chartered)			—	—	Do.			....	....	
12		Matanzas	Cuba.	50.000	—	—	Do.	180,000	8 50	....	....	
13		Mexico City	Mex.	250,000	—	—	Do.			....	....	
14		Montevideo	S. A.	500,000	—	—	Do.			....	....	
15		Para (Chartered)			—	—	Do.			....	....	
16	1854	Rio de Janeiro	S. A.	1,200,000	500	7½	Do.	300,000	4 00	....	....	
17		San Iago	Chile.	500.000	—	—	Do.	180,000	7 00	....	....	
18	1857	Saint Jago de Cuba	Cuba.	450,000	500	—	Do.	25.000	5 00	....	....	
19		Valparaiso	Chile.	500,000	—	—	Do.	85,000	6 00	....	....	
20		Vera Cruz	Mex.	500,000	—	—	Do.			....	....	
21		Ville Clara	Cuba.	50,000	—	—	Do.			....	....	
22		Auckland	N. Z.		—	—				....	....	

ON THE UTILIZATION OF PEAT, WITH REFERENCE MORE PARTICULARLY TO THE MANUFACTURE OF HYDRO-CARBON OILS.

By B. H. Paul, Ph. D.

(From the London Artizan.)

[Continued from page 342.]

Besides the compression of peat, various other modes of improving it for use as fuel have been tried; the general principle of all these modes of treatment is the kneading or pugging of the peat, so as to give it a more uniform and compact texture and greater density. Peat which has been prepared in this way will have, when dried, a density equal to that of coal; but I have never been able to perceive how these operations can be advantageously applied to peat, for the following reasons: In the first place it must be remembered that to obtain a ton of dry peat it is necessary in the kneading or pugging which is intended to improve its texture to operate upon five tons of material. Supposing that to be rendered practicable by suitable mechanical contrivances, so as not to cost more than it is worth or more than is proportionate to the consequent improvement of the peat, it must be remembered that this kneading or pugging of the peat does not separate the water—it does not dry the peat. This—which is the greatest difficulty of all in regard to the use of peat—still remains to be done, and even admitting that some of the water may be separated by the pugging, there will be at least three tons of water to evaporate in order to obtain one ton of dry peat.

The idea of employing heat to evaporate that water, of drying the peat artificially, is quite out of the question, since the consumption of fuel for that purpose would be quite disproportionate to the value of the peat obtained. The only plan of drying that is practicable is air-drying, and to dry peat by exposure to the air it must be spread out over a large surface. Every ton of dry peat will require 75 square yards of drying-ground; and if the quantity of peat required every year is 30,000 tons, the area of the cutting-ground will be one square mile at least. Now, if the peat is to be submitted to the operation of kneading or pugging, and has then to be dried by exposure to the air, it must, if the pugging machinery is fixed, be carried to the machine, and then carried back to the spreading-ground. This carriage to and fro will amount to ten times as much as the carriage of the peat itself, and must add considerably to the cost. If, on the other hand, the pugging machine be locomotive, another obstacle to the adoption of this plan of treatment arises from the necessity of carrying out the cutting and spreading of the peat within a very limited time, as I have already pointed out.

Now, when we consider all these circumstances, and compare the cost of applying this treatment to peat with the results effected by its application, I think it must be obvious to any one acquainted with the peat districts, with the use of machinery, and with the value of fuel, that the attempt to apply such treatment to peat is like breaking a fly upon a wheel, that the means are totally disproportionate to the end, and that the use of peat as fuel is altogether dependent on local circumstances, the principle of those circumstances being the want of coal or the high price of it, and the presence of an abundance of peat of good quality. These are the circumstances which would determine the consumer of fuel in choosing peat or coal. It is entirely a question of cost. To the landowner there may be, in some cases, other inducements to promote the use of peat in place of coal—such, for instance, as the employment of a population which would otherwise be in idleness—the desire to clear away the peat and make land available for agricultural purposes—but these circumstances are all incidental, and of a nature foreign to the true merits of the question as to the value of peat as fuel.

I am quite convinced, however, that there are many places in the Highlands of Scotland, and perhaps also in Ireland, where the concurrent influence of a variety of circumstances favorable to the application of peat as fuel, is sufficiently great to admit of a vast amount of good being effected by carrying out the cutting of it on a large scale. Thus, for instance, steam communication between Glasgow and the various ports of the Western Islands of Scotland is still very expensive on account of the necessity of sending out the coal for the return passage of the steamers. The cost of the coal consumed in the steamers running between Glasgow and Stornoway is about £80 each passage, and there is much more than a mere probability that a judicious and liberal-minded application of capital would be successful in establishing the use of peat as fuel in those steamers on their return passage to Glasgow. The applicability of the peat for this purpose is indubitable. I have employed peat as the only fuel for steam boilers during the last four years, and have found it to answer admirably. It has also been tried by Mr. James Napier, of Glasgow, on board his steamer the *Lancefield*, and he is of opinion that it might be used in the place of coal. The fact of its being only half the fuel value of coal would, in this instance, be counterbalanced by the advantage of its cost being less than that of coal. Besides this, the steamers running between Glasgow and the Western Islands are chiefly supported by the freights from Glasgow; their return cargoes are sufficiently small to admit of their using peat as fuel, although a greater weight and bulk would be needed of it than of coal. Moreover, the peat being a natural production and incumbrance of those islands, its use for this purpose would at once be a means of establishing a productive industry, and also of affording what is so much needed there—a great opportunity for employment—while at the same time the condition of the people would be bettered, and, by the removal of the peat, land would be cleared for cultivation, and the climate improved and rendered less unfavorable to vegetation. At present, however, the peat deposits of these islands, and of the Highlands generally, though containing the elements of social amelioration, of industry, and of wealth, lie like a huge inanimate chaos, burying the land which might yield abundant harvests, preventing the labor of the inhabitants, and hindering the development and maturing of the crops on those few patches of ground which are yet cultivated.

The next application of peat, and that to which I purpose to refer more especially in this paper, is the manufacture of oils and paraffin from it by distillation.

It will doubtless be remembered that, in the year 1849, great interest was excited in Parliament, and throughout the country, by the announcement that a method of obtaining valuable products from the peat of the Irish bogs had been discovered, and that a company had been formed for the purpose of carrying out, on a large scale, the manufacture of those products from peat in Ireland.

The proposed undertaking was very warmly supported by the press, and was described in a popular journal as constituting an Irish El Dorado.

This mode of working peat was devised by Mr. Rees Reece. It consisted in distilling the peat in a kiln, much in the same way as Lord Dundonald, in 1781, distilled coal for tar, oil, &c., with this difference, that Mr. Reece employed a kiln constructed more in the form of an iron smelting furnace at the bottom, and that he employed, as in such iron furnaces, a blast of air for the purpose maintaining the combustion of the peat at the lower end of the kiln, by which means heat was produced for distilling the peat at the upper part of the kiln. By thus distilling peat, a tar was obtained which, on subsequent distillation and treatment, yielded oil and paraffin.

In consequence of the very great public attention directed to this project, an investigation of the subject was instituted, at the suggestion of Lord Clarendon and the Chief Commissioner of Woods, by the chemical officers of the Museum of Irish Industry, under the direction of Sir R. Kane. The results of that inquiry were published in a blue-book in the year 1851.

Among the products which were shown to be obtainable from peat, were paraffin and certain hydrocarbon oils, which it was proposed by Mr. Reece to use as solvents of india rubber and for lubrciating machinery.

These oils and paraffin were obtained, in the first instance, as tar, by distillation of the peat, and the results given in Sir R. Kane's report go to show that there is no serious difference in the nature and amount of the produce, whether the distillation of the peat be conducted in close retorts, or in kilns, as proposed by Mr. Reece.

The experiments that were made with different kinds of peat gave the quantitive results shown in the following table:

	Kind of Peat.	Pounds per cubic foot.	Peat Distilled in Retorts.		Peat Distilled in Kiln.		
			Percentage of Tar.	Percentage of Oil from Tar by weight.	Refined Oil from 1 ton Tar, galls.	Percentage of Oil from Tar by weight.	Refined Oil from 1 ton Tar, galls.
Sir Robert Kane and Mr. Sullivan.	1. Mixed light and dense turf (Phillipstown)	33.5	2.000	58.8	155	—	—
	2. Light surface turf (Allen)	21.0	3.577	46.1	121	2.510	144
	3. Dense peat (Allen)	29.7	2.767	43.8	115	2.395	113
	4. Light fibrous turf (Ticknevin)	30.3	2.916	70.2	184	—	—
	5. Light fibrous turf	30.3	2.344	64.2	168	—	—
	6. Light fibrous turf (Shannon)	17.5	4.417	88.2	100	—	—
	7. Dense Peat (Shannon)	53.3	1.462	70.1	184	2.270	132
	Average	—	2.787	63.9	147	2.391	123
Dr. Hodges.	8. Dense mountain peat (Antrim)	—	—	—	—	4.440	—

There is some degree of discordance in these results, but, taking the average, it will be seen that the peat distilled in close retorts yielded nearly 3 per cent. of tar, and when distilled in kilns it gave nearly 2½ per cent. In the former case the tar gave, on the average, rather more than half its weight; and, in the latter case, rather less than half its weight of refined oils and paraffin.

It must be borne in mind that all the varieties of peat referred to in Sir R. Kane's report are true "bog peat"—the only result quoted by Sir R. Kane for mountain peat being that obtained by Dr. Hodges, of Belfast, in 1850, from an experiment conducted by him with about 50 tons of peat at Newtown Comelin, in Antrim.

Taking the average of these results, the 100 tons of Irish bog peat would yield, by distillation in close retorts, 2 tons 15 cwt. of tar, which gave by subsequent treatment 409 gallons of refined oils and paraffin, and by kiln distillation the 100 tons would yield 2 tons 8 cwt. of tar, or 304 gallons of refined oils and paraffin.

If this tar, or the oils and paraffin it yields, be taken as the sole commercially valuable products from the distillation of the peat, and if the cost of the peat is taken at 2*s.* per ton, as set down by Mr. Reece, and quoted in Sir R. Kane's report, the tar would cost, for raw material alone, about £4 per ton, and the cost of raw material equivalent to one gallon of refined oils and paraffin would be 7*d.*

Adding to this cost of raw material the cost of making the tar and refining the oil and paraffin as amounting jointly to 1*s.* per gallon, the total cost of the refined product would be 1*s.* 7*d.* per gallon.

It is not very probable that at this rate of cost the manufacture of these products from peat would be very remunerative, especially at the present market price of these oils and paraffin; but in Sir R. Kane's report, which has especial reference to Mr. Reece's project for working peat, other products besides the oil and paraffin are taken into account as adding to the profits that might be expected from this undertaking.

These products are sulphate of ammonia, acetate of lime, and wood naptha; and so much were they re

garded as a source of profit to be anticipated from the working of peat, that in the prospectus of the Irish Peat Company they were set down as furnishing more than one-half of the expected profits of the works.

The values assigned to these products in Sir R. Kane's report are not indeed quite so great, as regards the amount, as those stated by Mr. Reece, but they are, nevertheless, considerable, being for the 100 tons of peat as follows:

MR. REECE.

Sulphate of ammonia, 20 cwt., at 12s	£12 0
Acetate of lime, 4 cwt., at 14s	9 16
Wood naphtha, 52 gals. at 5s	13 0
	£34 16

SIR R. KANE AND MR. SULLIVAN.

Sulphate of ammonia, 20 cwt., at 12s	£12 0
Acetate of lime, 4 cwt., at 14s	2 16
Wood naphtha, 52 gals., at 5s	13 0
	£27 16

These results have a very attractive appearance, even in both cases; but a closer examination of the subject of peat working, from a commercial point of view, led me to the conclusion that it is a fallacy to regard these products as constituting a source of profit to be obtained in working peat. On the contrary, I consider that no reliance should be placed on the value of these products as contributing in any way towards the possibility of peat being worked advantageously. They should be regarded strictly as waste or bye products, and the question whether peat can be worked remuneratively must be determined by regarding the oils and paraffin alone as the staple products. If these can be obtained in such proportion and at such a cost as to afford a profit on the manufacture, it may then become a question to consider whether the bye products obtained in that manufacture are not worth working up for the sake of the ammoniacal salts and other materials they would yield. This question would be determined one way or another by a variety of circumstances of more or less special nature. Among others, the possibility of making some portion of the waste of the chemicals employed in the purification of the oils and paraffin, available for working up these bye products, would be of prominent importance, inasmuch as that would, to some extent, reduce the cost of purifying the oils, &c.

I shall have occasion afterwards to point out results corroborative of this view, as to the really valuable products of peat.

Keeping this principle in view, meanwhile, I will now request your attention to the production of paraffin and oil from peat. In the early part of 1858, I was consulted as to the possibility of working the tar obtained from the peat of the Island of Lewis, one of the Hebrides. The peat occurring in this island is, as I have before mentioned, a true mountain peat, and, like most of the peat in the Highlands of Scotland and north of Ireland, is a remarkably rich, bituminous variety. It is of a dark brown or black color, and heavier than water, weighing sometimes as much as 78 lbs. the cubic foot. It burns with a brilliant white flame, of great length, and considerable heating power, indicating the presence of a large amount of bituminous substance.

The tar obtained from this peat by distillation was quite solid at the ordinary temperature; it was of a dark brown color, with a penetrating odor of creosote, and melted on the fingers like butter, in consequence of the paraffin it contained. Its density was 0.960.

The analysis of this tar showed that it yielded hydrocarbon oil and paraffin of good quality. Two samples, one made in a close retort, the other in a kiln, gave the following results by weight:

	Retort.	Kiln.
Refined oil and parafin	42.161	41.167
Creosote	30.459	47.068
Charcoal, gas, and waste	27.380	11.765
	100.000	100.000

These quantities correspond respectively with 112 and 107 gallons of refined oil and paraffin from the ton of tar.

About a ton of the tar was then operated upon for the purpose of getting the products in such quantity as would admit of their being tested as to their applicability for various purposes.

The oil obtained from the tar was purified by the ordinary methods of treatment applicable to such materials, and was then separated by distillation into two portions; one portion of the oil, amounting to about one-half of the gross refined product, was quite liquid even at low temperatures; it was of a pale yellow color, with a slight and not unpleasant smell. It burnt well in the lamps commonly used for hydro-carbon oils, with a brilliant white flame. It did not carbonize the wick, while burning, or resinify by exposure to the air. Its boiling point being above 390° F., there was no danger of its giving off explosive vapor at any temperature it would be likely to be heated to when used in a lamp, and, as compared with some other oils of good quality, it gave, measure for measure, a greater quanity of light.

The other half of the oil was partly solid at the ordinary temperature; it consisted of an oil of greater density than the one I have just mentioned, and of higher boiling point, mixed with a great quantity of paraffin partly in solution and partly crystallised. This paraffin was easily removed by a filtering bag, and the dissolved portion was separated by cooling the oil and then filtering it again. The paraffin thus obtained amounted to about one-tenth part of the gross refined product. The oil from which the paraffin had been separated was, like the other oil, of a pale yellow color, and had scarcely any smell. It burnt with an intense white, luminous flame, and when mixed with fat oils formed an excellent lubricator.

The proportion of refined oil and paraffin which I obtained from the ton of tar was about 112 gallons in all; in round numbers it might be said that on a working scale the tar on which I operated would give 100 gallons refined oils and paraffin per ton. This was very much less than the average amount of the products obtained by Mr. Sullivan from the Irish peat, as stated in Sir Robert Kane's report; but, on the other hand, the amount of tar obtained from the Irish peat was very small, and I expected, from the difference between the peat operated upon by Mr. Sullivan and that of Lews, that this latter, being of a much more bituminous character, would yield by distillation a large amount of tar.

With regard to the possibility of carrying on the manufacture of these products on a large scale, everything depended upon the cost at which the tar could be produced. Judging from the results that had already been obtained, it appeared to me that £5 per ton was the maximum price that could be allowed for the tar, supposing it to yield 100 gallons of refined oils and paraffin, and that with this cost for the tar, it would be possible to work it profitably if the purification of the oils did not cost more than six-pence per gallon.

These limits having been fixed as to the cost of tar and refining the oils, it became requisite to ascertain the cost of the peat, the amount of tar it yielded, and the cost of production. At that time the cost of the peat on the moor was 2s. 6d. per ton for cutting, drying, and stacking by contract, but there were satisfactory reasons for expecting that it could be obtained at a less expense. These expectations were subsequently realized, peat having been obtained by contract in succeeding years at 2s., 1s. 9d., and 1s. 6d. per ton; and some which I had cut under my own direction did not cost more than 1s. per ton stacked on the moor. I now think that from 1s. to 1s. 6d. per ton might be fairly taken as the prime cost of air-dried peat containing 20 to 30 per cent. of water.

(To be continued.)

MONGRUEL'S NEW LIGHT.—This transparent humbug has run its short course in England, and vanished from the sphere of observation. It has been examined by several eminent gas engineers, who pronounced it to be just what we asserted it was—troublesome, expensive, and dangerous, and utterly devoid of originality. We hope our English exchanges will contain no more allusions to this exploded imposition.

GAS-LIGHT HEAD DRESSES.—The London *Journal of Gas-Lighting*, copies our description of the new feature in the application of gas to ornamental purposes, and of course gives credit to another serial for the same. Brother Bull is at his old tricks again. The old gentleman needs watching.

ON THE COMPOSITION OF GAS-REFUSE.

BY DR. T. L. PHIPSON, F. C. S., &c.

It has been estimated that one ton of Newcastle coal gives off in distillation as much cyanogen as is contained in five to eight pounds of Prussian blue. As sulphuretted hydrogen is disengaged at the same time in greater or smaller quantities according to the nature of the coal, it is natural that sulphocyanides should form also. My attention having been lately directed to gas-refuse obtained after eliminating the sulphuretted hydrogen and carbonic acid by hydrated oxide of iron and lime purifiers, I found in this substance certain sulphocyanides, and it occurred to me that it might prove a source of sulphocyanide of ammonium for photographic purposes. But the samples I have hitherto examined, having been used as long as possible, with a view of obtaining the maximum amount of sulphur, have not promised so much sulphocyanide as I should expect to find in the refuse purifiers which had not been employed for so long a period. It is curious to note, however, that this substance, which is offered to manufacturers of sulphuric acid on account of the sulphur it contains, has also been recommended to makers of artificial manures and to agriculturists as a cheap source of nitrogen! It will be seen by the analysis I subjoin that the employment of this substance for agricultural purposes is not only useless, but may become highly injurious to any soil. Besides the cyanogen compounds I have found in it, and which must be considered as prejudicial to vegetation, the existence of tar-products, highly antiseptic and therefore capable of preventing organic decomposition in the soil—a process indispensable to vegetation—is evident; it contains also a very large amount of free sulphur.

When this gas-refuse has been exposed for some time to the air it contains the following substances:—Free sulphur in considerable quantity, oxide of iron, carbonate of lime, cellulose in small quantity, some hydrocarbons soluble in alcohol, double cyanide of iron (green), ferrocyanide of iron (blue), sulphocyanide of calcium, sulphocyanide of ammonium, chloride of ammonium, sulphate of lime, ferrocyanhydric acid (to which the mass owns its acid reaction), and water. Some of these are present in small quantity only, but it is not difficult to put them all in evidence. A rough analysis of the whole has given me—

Water	14.0
Sulphur	60.0
Organic matters insoluble in alcohol	3.0
Organic matters soluble in alcohol: sulphocyanide of calcium, chloride of ammonia, hydrocarbons, &c.	1.5
Clay and sand	8.0
Carbonate of lime, oxide of iron, &c.	13.5
	100.0

Hot water extracts sulphocyanide of calcium and ammonium, sulphate of lime, and ferrocyanhydric acid. The solution takes a red color with persalts of iron.

Hydrochloric acid dissolves a considerable amount of the substance, and the solution obtained is deep blood-red, almost opaque, from the presence of sulphocyanide of iron formed.

Alcohol extracts principally sulphocyanides of calcium and ammonium, chloride of ammonium, a small quantity of hydrocarbons, and ferrocyanhydric acid.

By evaporating the aqueous solution to dryness, after having added enough carbonate of potash to neutralize its acidity, and treating the residue by alcohol, the ferrocyanhydric acid is left behind as ferrocyanide of potassium, and the alcoholic solution contains only chloride of ammonium and sulphocyanides of calcium and ammonium. By evaporating in presence of an excess of carbonate of potash to complete dryness, and treating with alcohol, the latter takes up principally sulphocyanide of potassium, and by using carbonate of ammonia, in place of carbonate of potash, the alcoholic solution consists of sulphocyanide and chloride of ammonium, which would serve for fixing photographic proofs.

The green compound which forms when gas-refuse is exposed to the air, is no other than the double cyanide of iron, $FeCy + Fe_2Cy_3$, discovered by Pelouze, the composition of which corresponds to magnetic oxide. By prolonged oxidation in the air it becomes blue; cold acids have no action on it, but hot nitric acid decomposes it.

THE AMERICAN GAS-LIGHT JOURNAL is published on the 1st and 15th of every month, and is the recognized official organ of

LIGHT, HEAT, WATER-SUPPLY AND SEWERAGE.

Its purpose is to ascertain and make known all new discoveries in the science and economical application of LIGHT, and promote thereby the interests of companies and consumers; to encourage and aid the introduction of PURE WATER from Lakes and Rivers into Towns and Cities, and to improve the system of SEWERAGE, VENTILATION, HEATING, and DRAINAGE everywhere.

THERE ARE 20,000 CITIES AND TOWNS IN THE UNITED STATES, CAPABLE OF SUPPORTING GAS-WORKS, WHILE THERE ARE NOT 400 GAS-WORKS IN OPERATION IN THE WHOLE COUNTRY!!!

TERMS—CASH IN ADVANCE.

SUBSCRIPTION—In the U. S. and British Provinces, $3 per annum. In Great Britain, 12s. per annum, payable in British post-office orders, remitted to the Editor, as below.

ADVERTISEMENTS—According to position and space occupied.

☞ Remittances by mail to be addressed to the Editor,

C ELTON BUCK,

ROOMS of the AMERICAN GAS-LIGHT JOURNAL,
No. 39 Nassau st., cor. of Liberty st., opposite the Post-Office.
New York City.

AGENTS OF THE AMERICAN GAS-LIGHT JOURNAL

FOREIGN.

Germany .....B. WESTERMAN & Co., of New York.
Great Britain....TRUBNER & Co., 60 Paternoster Row, London, where single copies may always be found,
Paris, France. .. { LE JOURNAL DE L'ÉCLAIRAGE AU GAZ, 25 Boulevard Poissonnière.

DOMESTIC.

V. HAROLD MYERS, No. 152 South Fourth st., Philadelphia.
The AMERICAN GAS-LIGHT JOURNAL can be purchased of all the newspaper and periodical dealers in the U. States and Canadas.

THE
AMERICAN GAS-LIGHT JOURNAL,

PUBLISHED ON 1ST AND 15TH OF EVERY MONTH.

C. ELTON BUCK, ... EDITOR.

FRIDAY, MAY 15, 1863.

The cheapness of kerosene oil, and the conveniences attending its use, have, in several localities in this country, caused former customers of gas companies to use lamps in preference to gas for obtaining artificial light. The quality of the refined petroleum and coal oils which are now so extensively sold, is so superior to that of the oils formerly offered—at least, so far as safety is concerned—that the greatest argument of its opponents—that of danger—has been taken away, and the less powerful but no less true plea of greater trouble and expense is the only one now left to the advocates of the oils. Paradoxical as it may seem, the principal reason why consumers prefer the use of oil to gas is, that they deem it less expensive—that its use does not incur to them the amount paid for gas. But when the correct standard of judgment is observed, the truth will be found to be just the reverse of this assumption.

Those who, from economical motives, have chosen the oil in preference to gas, base their opinion upon criteria long since demonstrated to be fallacious. They fail altogether to admit that, in comparing the relative value of illuminating agents, the quantity and intensity of the light forms a part of the calculation quite as important as the computation of the money expense—the former in reality determining the amount of the latter. Judged by this standard, in towns and cities in our seaboard States, or throughout the country at distances remote from the oil region, we think the question of comparative economy should be decidedly in favor of gas. A number of gas companies have temporarily lost consumers who thought they would benefit themselves by burning oil on the score of cheapness; but numbers of them, after having given the two agents a fair trial, have returned to the use of gas as being not only more convenient and safe, but vastly cheaper also. This has not been the experience of all, however, for some companies have felt a continued falling off in their consumption, and a corresponding dilution of their profits.

But in the immediate vicinity of the oil wells, where the refined petroleum may be had at a very low figure, gas companies have experienced a very depressing effect, and in some instances have hardly been able to continue to meet running expenses. In Canada this result has been particularly felt; and the future of some of these companies appears dark and unpromising in the extreme. We have been informed, from official sources, that certain gas companies in that province are in such a depressed condition that unless the wells give out, or diminish their yield, and the price of oil advances, they may be compelled to suspend operations altogether, for by continuing to manufacture gas against such a ruinous competition, nothing but serious losses ensue, and the whole capital is in danger of being sunk.

From all that we can learn of the gas companies throughout the United States, although a number of them feel the depressing effects of this competition of petroleum oils, yet none of them are in so hopeless a plight as some companies across the border. In most of our large cities and towns the business of gas companies has increased very handsomely, and their shares represent a value firm and unshaken. And despite the prediction of the London *Journal of Gas-Lighting*, the progress of gas-light has not yet received the very serious "check" which our amiable contemporary was so well pleased to foretell.

UTILIZATION OF SEWAGE.

For the past few years the English scientific periodicals have been discussing the feasibility of profitably applying the sewage of towns and cities to agricultural purposes. This question has been agitated throughout the island, and has formed the theme of addresses before farmers' clubs, for articles in scientific journals, and leaders in the secular press, together with items recording the trials of the system in particular places. The well-known views of LIEBIG and other eminent chemists on the value of sewage manure, and the efforts of Alderman MECHI, of London, and other advocates of its employment, are so familiar to observers of current affairs as to need no repetition here. Experiments on the large scale have been instituted in several parts of England, to test the value of sewage applications, and the results of these experiments, although differing widely in several instances, have been freely discussed, with a view to elicit the truth, and to set at rest the question which has been so long in abeyance.

The later opinions of students of this subject have been almost unanimously expressed against the feasibility of utilizing sewage for the purpose of manuring land. One of the best articles in reference to it, we find in a recent number of that excellent weekly, the London *Chemical News*, in which the impracticability of the whole thing is shown—the expense of making the application of this kind of manure being the cause of its failure. We quote from this article as follows:

"There is no doubt that sewage when put upon cultivated land, does act as a powerful manure, and produce very excellent results in augmenting the produce of the land. This has long been proved and admitted by every one; and this is precisely the circumstance which leads people astray in their opinions as to the utilization of sewage. If, they argue, this can be done here or there on this or that patch of ground, why should it not be done with the whole of the sewage of London, and why should not the immense quantity of material now wasted be realized? The reasons why it can not be done have been given over and over again—any time these six years past—but they have not been heeded. Those reasons are of precisely the same kind which operate against the extraction of gold from Welsh minerals, and are probably much more forcible. It is all very well to say there is a bar of gold weighing forty or fifty ounces, and to appeal to that as a conclusive proof that it can be got; or to say that such and such results have been obtained by applying sewage to land. This kind of evidence and argument will have great weight with many, but it is not conclusive, nor is it to the point. If the gold has been extracted, and which is worth some £4 an ounce, has cost £6 an ounce to get, and if this fact can at once be perceived, there is an end to the chimerical opinions as to its value, and the possibility of extracting it. To all intents and purposes it might as well not be there."

The argument above alluded to—that of hastily pronouncing sewage manure a success without having examined its cost—is the very one which its advocates use. It is undoubtedly true, that millions of tons of the most nutritious substances for vegetables are annually lost and wasted in our large cities. But, in the condition in which this matter exists, it is simply absurd to suppose it capable of being used without great cost. In order to render it fit for employment, and to transport it to the localities where it is to be applied, the expense attending the use of town sewage would far outweigh its value. Manures to be worth handling and transportation must be concentrated, or they will never pay for the trouble expended upon them.

Dr. ECKFELDT, the assayer of the United States Mint, in Philadelphia, not long ago made a series of examinations of the clay underlying that city, and found appreciable quantities of gold disseminated throughout it. Among other things remarked by the Doctor, it was stated that every cartload of clay taken from the immediate vicinity of Philadelphia, contained gold enough to pay for the cartage. The gold is undoubtedly there, yet who ever supposed that any one ever seriously entertained an idea of working such placers? This is a case precisely analogous to the town sewage plan—in plain English, it will not pay; and the sooner the public are convinced of this fact—for fact it is—the sooner will they make up for the time and money lost in pursuing fruitless experiments.

THE GREAT "GAS SWINDLE" OF BROOKLYN, NEW YORK.

A certain well-known gas-engineer of Philadelphia remarked to a gentleman the other day, "The Citizens' Gas-Light Company of Brooklyn is a big swindle, and the editor of the AMERICAN GAS-LIGHT JOURNAL know'd it from the beginning."

Coming from such high authority, the reputation of the Citizens' Company is stamped, as are its projectors, stockholders, officers, and advocates.

It was before the adjustment of the controversy, however, that this opinion was expressed; now that the Citizens' has become a "regular," we may suppose that our friend will take stock and be content.

It is cheering, nevertheless, to hear these oracles of gas mysteries pass judgment on new or rival companies. The idea that such men as HENRY VAIL, cashier of the Bank of Commerce, JOHN STEWARD, a retired millionaire, WM. P. LIBBY, the President of the Company, and the long list of corporators of this Company, should be capable of engaging in a swindling operation, is too preposterous to refute.

We would like to ask this oracle whether the Harlem Company was a swindle in its organization. It encroached upon the domain of the Manhattan Company, and if the act of squatting constitutes the charge of swindling, then perhaps the organizer of of the Harlem Company stands self-convicted.

There is a phrenological development in some men called self esteem, and we should not wonder if *our* friend knew somebody who possessed it. To him,—the self-selected, but as yet *non-elected* engineer of the Philadelphia Gas-Works,—it is not wonderful that all the world should appear as invaders of his territory, but he must remember that, as it takes more than one *brick* to build a city, so it may take more than one company to light it.

The Citizens' Gas-Light Company is all right now—just as it should be; it was organized for legitimate purposes, and it has, by a dignified and conservative course, acquired the high position it claimed.

Should it at any time be so forgetful of the errors of its opponent as to assume them towards others, we shall rap its knuckles as roundly as we have done those of its ossified progenitor.

GOOD FOR THE LIGHTS.—When the Russians visited London in 1832, and ate up all the tallow candles they could find, Sydney Smith said it was "bad for the liver, but good for the lights."

FINANCIAL.

Thursday Evening, May 14th, 1863.

Gas-light stocks may now be said to rank among the standard and favorite securities of the day.

From an obscurity wholly inconsistent with their intrinsic value, in which we found them buried on the first day of July, 1859, they have sprung into the foremost rank of values, and so general has been the appreciation of their worth that they may to-day be safely said to average fifty per cent. advance upon the prices current at that date.

New York city gas companies of course take the lead with capitalists; but in that wild and blind race which the shrewdest sometimes engage in, the shares of these corporations remain at the extreme price which they had attained before the division of the surplus profits a few months ago. Thus, the old *New York* Gas Company's stock remains at about 325 to 350 per cent., and *Manhattan* at 275 per cent., neither being now intrinsically worth anything like those prices, and, if what their directors say is true, they will not be so for some time to come.

The *Metropolitan*, N. Y., Company's shares are sought after at about 150 per cent., although the works are not yet in operation. No stock is on the market at the moment. The works will commence business about July 1.

The *Citizens'* Company of Brooklyn, N. Y., took quite a jump towards the close of April, from 100½ to 132½, in consequence of the adjustment of its difference with the Old *Brooklyn* Company, by which it succeeds to a valuable district. It has since sold down to 129½.

Old *Brooklyn* Company's stock is strong at 170—a rise of fully 30 per cent. within the last ten days of April, and from the same cause.

Of out-of-town companies, some investments have been made in *Paterson*, N. J., a well-reputed company, in a populous and thriving manufacturing town, increasing yearly in importance. It is a six per cent. stock, the surplus being invested in improvements. Perhaps a little quicksilver might be infused into the management of this company without doing it any harm. We consider it one of the best provincial companies.

Inquiries have been made of us as to the value of the *St. Paul*, Minn., Company, and we would be glad to get some information on this subject.

West Troy, N. Y., is looking up. The Government arsenal and factories have materially increased the consumption of gas, and the company is doing well, dividing three per cent. semi-annually. The principal street of this town is about to be paved with the Belgian pavement, which will facilitate its increasing business as an auxiliary to Troy proper, on the east side of the Hudson river. The stock of the *West Troy* gas company should rate at 85 to 90, as compared with the prices of other similar companies.

A parcel of *San Francisco*, Cal., gas stock is on the market at 125 per cent. It divides 9 per cent. per annum. We do not know more of the company's position than is found in the tables.

Evansville, Ind., stock is also offered for sale. This company has always ranked high as a well-managed concern.

One of the largest stockholders of the *Cold Spring*, N. Y., gas company offers a portion of his stock, with the privilege of a seat in the direction to the purchaser. For a country company it is a fair investment.

Parcels of stock are offered also in the *Fishkill*, N. Y., *Rondout and Kingston*, N. Y., *Scranton*, Pa., *Bridgeport*, Ct., and other suburban towns.

It will be seen by our advertising columns that Mr. Albert H. Nicolay, the well-known auctioneer and banker, deals in gas-light shares, as does Mr. John Moss, Jr., No. 83 Wall street, both of whom may be relied upon for their promptness and integrity in the negotiation of business transactions.

WATER-METERS.

In the various reports of water companies throughout the country, abstracts of which we have published from time to time, much emphasis has been laid on the extravagant waste of water, noticeable everywhere, and the importance of this subject is recognized as of the very first moment. In nearly every one of these reports the value of water-meters is proved, and their efficacy in checking waste and preventing ruinous extravagance is acknowledged. In our last number we gave an abstract of the report of the Commissioners of Nassau Water Supply of Brooklyn, N. Y., in which the meter was alluded to as the only true remedy for the wholesale abuses at present existing. The remarks of Mr. Rhodes, the water purveyor, deserve the hearty commendation of all interested in the permanence of water supply; but they need something more than a mere mental assent. Such arguments are unanswerable, and although they refer particularly to Brooklyn, they will apply with equal force to every city in the world. In the present number of the Journal, will be found an abstract of the last annual report of the Cincinnati, O., water-works, in which the subject is discussed in a forcible manner, and the necessity of preventing the wanton waste of water, now so universal, is urged in such a manner as to demand close attention. We commend this matter to water engineers throughout the country, and hope that ere long we may be enabled to chronicle some real progress in this important matter. Thus far we have scarcely advanced at all.

ANSWERS TO CORRESPONDENTS.

O. E. S., of Mass.—*You may possibly obtain a copy of either Wiley, Appleton, or Balliere.*

J. S., of Md.—*The Company do not publish a report. They manage their affairs very quietly and avoid publicity as far as possible.*

E. B. E., of Pa.—*It may answer the purpose, but we have our doubts about it. The idea is novel, so far as we know, and is highly ingenious; but it hardly seems likely to succeed.*

C. L. F., of R. I.—*Paraffin and Olefiant gas are identical in composition, both containing the same number of equivalents of carbon and hydrogen.*

J. T. M., of Ind.—*The works at Aurora, were altered to coal-gas works a few months ago, but this was while Mr. Severin was in England, and without his knowledge or consent. He has still strong faith in the ultimate triumph of the process.*

R. S. B., of Va.—*Your favor was duly received. We will attend to your request.*

L. E. I., of Oregon.—*We can furnish back numbers from the commencement.*

American Meter Company.—Our readers will be apprised, by an advertisement on another page, that a combination has been formed by the three principal gas-meter firms, Down & Merrifield, R. H. Gratz & Co., and Code, Hopper & Co., under the corporate name of The American Meter Company, for the manufacture of gas-meters. They are to have three large factories, one in Philadelphia, one in New York, and one in Boston, in order to encompass the entire gas interest.

The result of this arrangement will be, that the individual gas-meter makers will enter into a closer competition with this wealthy company, in order to retain their share of patronage. There is room for all, and work enough for all.

Messrs. Harris & Brother.—We call the attention of our readers to the advertisement of Messrs. Harris & Brother, of 117 Cherry street, Philadelphia, which will be found in its appropriate place in this number of the Journal. This firm have associated with them as a partner, Mr. P. F. Hagar, and continue, as heretofore, to manufacture gas-meters, and all kinds of apparatus used in gas-works.

Logansport, Ind.—A charter has been obtained from the Indiana Legislature for a gas company in Logansport. This is a thriving town, and ought to support gas-works easily. The works as yet have not been commenced.

Metropolitan, N. Y.—This company expect to commence making gas in June. Their works are nearly completed, and in point of size, and in completeness of finish, they are probably superior to any gas-works on this continent. We expect shortly to give a description of the Metropolitan Works. At present, we content ourselves with saying, that, built under the efficient management of John P. Kennedy, Esq., constructing engineer, they could hardly help being superior in every respect. Mr. Kennedy's connection with many of the prominent gas-works throughout the country, both North and South, and the character of the works he has constructed, are well known to the profession.

San Francisco, Cal.—Opposition gas companies seem to be the order of the day now. We hear that a new company has been chartered by the Legislature of California, for the purpose of lighting the city of San Francisco. We are not apprised of the particulars of this new concern, or whether it will wage a bitter war on the old company, or whether a separate district will be allotted to it. Districting seems to be fashionable now-a-days—that is, if the new companies are powerful enough to compel it, which is generally the case, *e. g.*, the Metropolitan, of this city, and the Citizens', of Brooklyn.

A New Water-Gas Process.—Another new water-gas process has been devised, and the preliminary trials have satisfied the inventor of its entire feasibility. At least, so we have been informed by an eminent gas-engineer. This process differs materially from all others that we have examined, and although we are not at liberty to disclose the mode of its operation for the present, we will announce it at the proper time.

The Glasgow Water-Works.—According to the quarterly report of Mr. Gale on the state of the water-works of Glasgow, Scotland, it appears that the average quantity of water sent into the city during January, February, and March last, was 16,460,000 gallons a day from the Loch Katrine works, and 3,330,000 gallons a day from the Gorbals works, being together 19,790,000 gallons per day, or more than the quantity used in the corresponding months of 1862, by 290,000 gallons. The works are said to be in very good order.

Gas from Seaweed.—A correspondent of an English publication advises that seaweed, when burnt for kelp and iodine, should be first distilled in gas retorts, by which a quantity of gas and tar may be obtained which would otherwise pass off into the air and be wasted.

Gas in Dixie.—From all that we can learn, the gas companies in the rebel States must be in a sad plight. Without retorts, coal, and many other necessaries of gas manufacture, many of them have been obliged to suspend operations, and their prospects have been forever ruined. All illuminating agents are scarce, and prices range at an enormous figure. If the traitors who inaugurated the rebellion were the only ones who suffer by this state of affairs we should rejoice; but the poor people—powerless as the slaves they own—are the principal sufferers, and for them there is no escape until the foul treason be purged from the land.

Voorhees' Patent Sink-Trap.—An invention which is likely to be of vast importance in a sanitary point of view, has just been made by Mr. T. B. Voorhees, of No. 60 Wall street, New York city. It consists of a sink-trap for the inlets of city sewers, and while it prevents the ingress of sticks, stones, or other rubbish which might choke up the sewer and cause it to overflow, at the same time it prevents the escape of noxious gas from the sewers into the streets, and thus preserves the atmosphere in a state of greater purity than any of the old plans of receiving sewage are able to do.

Sewerage boards and sanitary committees would do well to give this subject a full examination. At present we have time only to allude to it. We may recur to the subject again in an early number.

WATER-WORKS OF AMERICA.

CINCINNATI, OHIO

We have received a copy of the report of the Cincinnati Water-Works for the year ending December 31st, 1862. We present herewith a *resumé* of the principal items of interest connected with the operations of the Works during the year:

From the report it appears that the total receipts of the Works from all sources during the year, and including the balance on hand January 1st, 1862, have been	$240,996 95	
The total expenditures	230,894 19	
Leaving a balance on hand		$10,101 76

The disbursements may be classified as follows:

Regular Expenses, including the pumping service, shop and reservoir account, repairs of street service, hydrant service, office expenses and salaries, interest on bonds, percentage on collecting water-rents and rents returned in office for vacancy, etc		$105,975 62
Special Water-Tax.—Amount refunded on property erroneously assessed		309 34
Fortifications of the City—Amount paid to Water-Works hands engaged on the fortifications, (a claim for which, to be refunded by the General Government, is now pending)		1,610 50
Street Service Extension Account.—Amount paid in settlement of claims for work and materials furnished in 1861, but not audited at the date of last report		6,366 34
Amount paid for work and materials furnished the past year		43,613 58
New Engine Account.—Amount paid on account of new engine and building; for work and materials furnished during the fiscal year, just closed		71,404 04
Total		$229,279 42

In the extension of the distributing pipes during the past year, 18,356 feet, or 3 476-1000 miles, of the following sizes, have been laid, viz.:

3,288	feet of	sixteen-inch	pipes.
767	"	ten	"
226	"	six	"
14,055	"	four	"

The total amount of pipes attached to the works at this date are 466,727 feet, or 88 395-1000 miles.

It is strongly urged upon the board, that hereafter no pipes be laid which have been cast horizontally, as it is impossible to secure a pipe in that manner that shall be of an uniform thickness. Almost all the pipes that have burst since the management of the Works has been under the charge of the late superintendent, have on inspection, proved to be (where the burst occurred) of a thickness varying from $\frac{1}{8}$ to $\frac{1}{4}$ of an inch, whilst on the opposite side they were from $\frac{1}{4}$ to 1 inch thick, and, as a natural consequence, as soon as any considerable corrosive action had taken place, they were unequal to the strain placed on them, and the concussion of opening or closing an adjacent valve has proved to them the *last straw* they could support.

The receipts of the Works from water-rates for the past year, presents gratifying evidence of returning prosperity to the mercantile and manufacturing interests of Cincinnati. A reference to the estimates made at the close of the last fiscal year of the Works shows that their income has largely exceeded expectations, and the Board have thus been enabled to prosecute contemplated improvements with as much vigor as the nature of the Works themselves would admit. At the commencement of the season it was thought that $50,000 would be as much as the Board would have at their disposal for the prosecution of the work on the new engine and building. More than $70,000 has been at their disposal to work on, and still a much larger balance is in the treasury than was estimated one year ago. It has also been a very favorable season for the work in hand, and, taking advantage of the low stage of the river, the new aqueduct has been completed, and the work on the new engine been placed in such a state of forwardness that the accident of floods can not now retard its progress to completion. Great praise is due to the efficient engineer, Mr. Geo. Shield, for his untiring energy and skill in overcoming the many difficulties by which he has been surrounded.

The water-rates charged to consumers, when the reductions lately ordered by the Board to be applied to the April bills of this year shall take effect, will be found, on comparison of the published reports, to be lower than those of any other city of the Union, supplied by pumping power, and will, it is believed, be regarded as proof of economy exercised in the management of the various departments. This will be the fourth reduction of the rates since January, 1860, and must be alike gratifying to the citizens and to the Board, who, by their suffrages, have been charged with the trust; especially when it is considered that the heavy reductions have been made during a period when very extensive additions are being made, both to the capacity for supply and facility for distribution, and the heavy attendant outlay has been derived, not from loans, but from the actual receipts of the Works. The Works will thus be spared the burden of an additional indebtedness, and, on the completion of the improvement, will be enabled to furnish their customers with an almost unlimited supply, at a rate proportionate to the cost of pumping, management, and repairs.

With the balance now on hand, the resources of the Works for the current year will be about $158,601 76, namely:

Balance on hand January 1, 1863	$10,101 76	
Estimated receipts from water-rents	145,000 00	
Estimated receipts from other sources	3,500 00	
Total		$158,601 76

The estimated expenditures for the current year are, for

Pumping, management, and repairs	$53,373 37	
Prosecuting the work on new engine and building, as per Engineer's estimate	70,000 00	
For extension of street service	27,000 00	
Total estimate of expenditures		$150,373 37
Leaving an estimated balance on hand January 1, 1864, of		$8,228 39

The estimates for the ordinary expenses of the Works are based on the actual expenditures in the different departments for the present year.

The estimate of expenditure on new engine account has been furnished by the engineer in charge, and embraces all which, in his opinion, will be required to finish the work and put on steam from boilers now in use, and also to put up a temporary building for the protection of the machinery until it shall have stood the test of a severe and successful trial.

In the extension of street service, the first work of urgent necessity will be putting down the forty-inch supply line (which is already nearly prepared and paid for.) The cost of this work and removing the old pipes is estimated at $6,000. The twenty-inch line, thus removed, will be laid elsewhere.

The average daily consumption of water has varied during the past year from 4,675,300 gallons in February to 6,793,414 gallons in August, the daily average for the year being 5,643,087 gallons.

It is assumed that the population in those districts of the city supplied with water from the Works is 150,000, which, from the last census, cannot be very far from correct; it shows an average daily consumption for all purposes of about 37½ gallons per head. This is a large amount, but not as large as the supply of many other cities. The average daily supply of Boston, from the last report, had reached over 80 gallons; in New York to over 90 gallons per head; and in London, where the supply is furnished on the intermittent system, instead of a constant flow, the daily average, taken from late returns, had reached the enormous amount of 100,000,000 imperial gallons, or 120,000,000 United States standard, or an average of 40 imperial gallons, 48 United States gallons per head of the inhabitants supplied. The Metropolis Water Act, passed in 1852, provided that in July, 1857, the intermittent supply should be changed to the constant system, but from late reports we find that the provisions of the act in that respect are disregarded both by the companies and the consumers; and the reasons given are, that the expensive changes in the private service pipes to adapt them to a constant supply induces the public to adhere to the old system with all its inconveniences, and the dread of waste, especially if it should reach the proportions exhibited in some American cities, would disable the water companies from meeting the demand. The Plumsted, Woolwich, and Charelton Water Company, when their works were first put into operation, in 1854, did furnish a constant supply, but the house apparatus and arrangements, over which the company had no control, were said to be so defective, and caused such excessive waste, as to compel the company to abandon the system.

But the average consumption per head is not a fair comparison between Cincinnati and densely populated London.

From the return of the superintending inspectors of the "General Board of Health," it appears that, in 1850, the several water companies of London furnished water for 270,581 houses, and the average daily quantity supplied was 44,383,332 imperial—53,260,000 U. S.—gallons, or 197 U. S. gallons per house, whilst in 1856 water was supplied to 328,561 of the 340,000 houses embraced in the Registrar General's district, and the average daily delivery was 81,025,842 imperial—97,230,010 U. S.—gallons, or 295 gallons per house. At the present time the supply is much greater; the reports of 1861 showing a daily average of over 100,000,000 imperial, or 120,000,000 U. S. gallons.

In Cincinnati there are now 13,333 hydrant attachments, and the average number in use during the past year has been about 12,500. The average daily supply, as before stated, being 5,643,087 gallons, shows the daily average per house to have been 451 gallons, an amount very largely exceeding the supply furnished by the London companies. Mr. Earnshaw, the former superintendent, who prepared the report, thus argues on the wastefulness shown by the people and the remedies suggested. These remarks are so truthful that we commend them to all interested in a full water supply. They apply equally to all cities.

"That an enormous and unnecessary waste of water exists in our community, is easily demonstrated. No family can *use* the average amount drawn daily from the Works; nor would they use it if the amount of their consumption was measured and they were required to pay for it. Self-interest is the strongest incentive to economy, and the advantage of the system of measurement, in all the operations of the Works, is evidenced from the statistics gleaned from our own operations during the past year. We have now 85 water-meters in operation, some being placed on manufactories, and a number in private, public, and tenement houses, and, under the resolution of the Board, wherever water-troughs are placed for public use in the street. In carrying out this resolution, I made it an inflexible rule, that wherever meters were attached for water-troughs they should also measure all the water furnished to the premises for other purposes; and having carefully ascertained the number of persons supplied with water through the meters, the following statistics are obtained: For water for horse-troughs alone the consumption has varied from an average of 76 to 586 gallons per day. Assuming that the general daily average has been 150 gallons, and deducting that amount from the meter-reading, I find that the household consumption, where the meters have been in operation, has not exceeded an average of 14 gallons per head, and in some cases, where meters have been applied exclusively to family consumption, the average daily supply has been less than 10 gallons per head, and this is all-sufficient for ordinary household purposes.

"I am fully convinced that the only sure guarantee against the enormous waste which has now become the crying evil of our Water-Works' system, will be found in the general introduction of a system of measurement.

"In this connection I do not wish to be considered as advocating the adoption of a miserly economy on the part of the consumer. I regard water as one of

the greatest boons Providence has vouchsafed to man, which it should be his privilege to use freely, aye, luxuriantly; but I contend that there is a strong line of demarcation between even luxuriant use and wanton waste, and I would stop the waste in order to enhance the luxuries. Almost every one is conversant with the truly regal munificence with which the ancient Romans supplied their cities with water. The industry of that extraordinary people may be judged from the fact that their supplies were obtained from sources varying from fourteen to sixty miles distant, and at one time there were no fewer than twenty aqueducts, bringing as many different streams of water across the wide plain, or campagna, on which the 'Eternal City' stands. Three of these aqueducts yet remain, monuments of the ancient grandeur of the empire. One supplies a great part of the lower town and feeds thirteen public fountains; a second supplies the eastern part of the city and feeds twenty-seven public fountains; and the third supplies the houses and fountains not served by the others. It is estimated that the volume of water thus conveyed to the city is greater than that furnished by modern means to a population six times as great, at Paris.

"The luxury of this copious supply is graphically described by the author of 'Rome in the Nineteenth Century,' where he says: 'Nothing strikes the stranger with more just admiration, on his arrival at the capital of the world, than the immense number of fountains which pour forth their unceasing flow of waters on every side. It is a luxury, the full enjoyment of which can not be felt but in such a climate as this, and those only who have known that delicious moment when the blaze of the summer day fades at last in the golden clouds of evening, can understand the voluptuous delight with which, in its hushed hour of stillness and repose, you listen to the music of their dashing murmur, and rest beneath their freshness.'

"But it must be remembered that with all this copious public supply, the most stringent precautions were taken to guard against private waste in the distribution for household purposes. From the volumes on Pompeii, Library of Entertaining Knowledge, we learn 'that the letting out of the public water to private persons was a source of revenue, the supervision of which was entrusted to an officer of high rank, and many precautions were taken to prevent fraud in this matter. The aqueducts were each charged with a certain number of supply pipes, and no new pipe could be inserted without a special application to the emperor. Permission being obtained, the applicant was assigned a calix, as it was called, of the assigned dimensions. This was a brass measure fixed in the castellum, or reservoir, the diameter of which regulated the quantity of water which could pass through it, and for which the applicant was charged. Beyond the calix, the pipe was private property; but more effectually to prevent fraud, it was enacted that, for a distance of fifty feet, the calix and the pipe should be of the same diameter. The right to a supply of water was strictly personal, not attached to houses, and the supply was cut off at every change of ownership, and the right previously granted was sold by the superintendents to the highest bidder. Those inhabitants whose means of interest were insufficient to obtain a private supply pipe, were obliged to carry their supply from the public fountains.'

"The waters of the fountains, therefore, having fulfilled their mission as sources of delight to all, both rich and poor, were turned to useful purpose in supplying the wants of those whose means were too limited to procure an independent supply. Can we not, in some measure, follow their example.

"We boast of our free schools, fountains from which the thirst for knowledge can be quenched, without money and without price, and why, I ask, should our mental wants be regarded with a special favor that is denied to our bodily necessities?

"In most of the European cities public drinking-fountains now greet the passer-by at almost every turn; where are ours? With the exception of the miserable excuses for drinking fountains in our two public playgrounds, for they are scarcely worthy of the name of *parks*, and from which the thirsty visitor could, perhaps, procure a cup of water, if he could only wait long enough for the cup to fill, we have only one, and that the gift of our philanthropic townsman, John Jeffrey, Esq.

"In Turkey, even, fountains stand by every mosque, and most of them have neat drinking vessels at hand, for supplying the wants of the thirsty traveler.

"Can we not, at least, keep pace with the old world in schemes for social improvement? or must our laboring classes, those on whose industry we depend for our boasted prosperity as a nation, be still driven to seething bar-rooms, where, in order to quench their thirst, they must squander at least a portion of their hard earnings, and deprive the families dependent on them for support, in many cases, of the very necessaries of life?"

These remarks are worthy of a careful attention, and we hope will be heeded by those for whom they were written. We also hope that hydraulic engineers throughout the country will add their arguments to those above presented, and do all in their power to induce the much-needed reforms for which there is such a necessity.

In the report of the engineer it is stated that supply to the reservoirs amounts to a total of 2,062,016,910 gallons, being an excess over the past year of 289,756,266 gallons, being the largest increase of per cent. consumption ever recorded at the Works.

The following compilation of monthly and daily average supply is presented:

	Total gallons delivered for the month.	Daily average gallons throughout the month.
January	145,276,301	4,686,332
February	130,908,408	4,675,300
March	145,251,813	4,685,542
April	142,817,221	4,760,574
May	179,899,393	5,803,206
June	186,845,373	6,228,179
July	201,440,360	6,498,076
August	210,595,845	6,793,414
September	190,205,650	6,340,188
October	206,439,348	6,659,333
November	175,705,861	5,856,862
December	146,631,337	4,730,043

Owing to the above increased consumption or demand for water, a similar increased consumption of coals must follow, amounting, in excess over the year 1861, to 16,967 bushels—the coal account of the past year standing as follows:

	Bushels.	
Coal on hand January 1, 1862	45,278	
Coal received from January 1, 1862, to December 31, 1862	92,610	
Total		137,888
Coal consumed during the year for all purposes	130,876	
Balance in bins and coal bunkers January 1, 1863	7,012	
To which add coal afloat and unloading	19,566	
Total		157,454

The machinery in the old building is in its usual "good order," and no accident has occurred to derange a constant and nearly uniform supply. The excess of head allowed in the reservoir being 18 feet 6 inches, while the quarter daily average throughout the year amounts to 17 feet 11 inches.

An occurrence of rather a serious and threatening character took place about the middle of February, which came very near cutting off, for a time, the necessary supply of water to the city.

During the fall of 1861 and the winter of 1861 and '62, such were the increased and constant height of the freshets, and the extraordinary amount of sedimentary deposits held in solution by them, that the four lines of inlet pipes, connecting with the river channel, became entirely closed, while the trifling aqueduct of the old building was nearly similarly conditioned; so much so that but for the fortunate bursting in of one of the lower pump room doors of the main building, during a heavy flood of the river, the supply must have been nearly, or entirely, cut off. After the fall of the river, the doorway, which had been the source of supply, became useless, the water having receded below its source of entrance; fortunately access was had to the well-hole covers along the line of the aqueduct, as the river continued receding, and finally the last well-hole was razed down to the top of the arch of the aqueduct, when an entrance was had at the mouth of the aqueduct, by the removal of an external fill, brought down during the heavy freshets. A very heavy expenditure to the regular service has been the consequence, owing to this aqueduct's want of capacity and further extension toward the river channel. Where larger quantities of water are conducted to the pumps, a greater quantity of deposit must necessarily take place, and nearly proportionate with the quantities used, providing the waters are similarly charged with sediment.

The labor of cleansing out the material thus compacted in the pump rooms, inlet passages and aqueduct, is extra expensive, as a large portion of the work requires damming off, temporarily, at the aqueduct mouth, admitting only a sufficient supply for the pumps employed in draining and supplying the reservoirs. Sunday being the only time when such work could be accomplished, owing to the lesser supply required, a small month of such days has been used during the past year for such purpose, with from fourteen to twenty men engaged in the operation of digging, wheeling, or hoisting out with windlasses, while, during the low water season, a number of hands have been employed in the channel outside of the aqueduct, clearing out the sand, etc., brought down by the heavy freshet of 1861, and early part of 1862.

Practice at these works has fully developed the folly of extra large steam passages, leading from the boilers to the steam cylinders of both the condensing and non-condensing engines, used in the pumping service.

The copying of proportions as used in the marine service of the United States, where pistons are traversing from 350 to 450 feet and upwards, per minute, and applying the like proportions to machinery whose pistons, maximum speed is placed at 200 feet per minute, carries the evidence of folly on its face, the correction of which is well worthy the attention of engineers engaged in the construction or management of water-works operated by steam.

The non-condensing engines of the Cincinnati Water-works, consist of two cylinders, each twenty-one inches bore and ten feet length of stroke, having induction valves of five and one-half inches diameter, with proportionate ports and steam-pipes, of a similar diameter in the clear. Over two years have elapsed since the steam-passages, two in number, have been reduced from five and one-half to two and three-quarter inches diameter, reducing at the connection of steam-pipe with the boilers to one-fourth its original capacity, and no other effect has been produced save and except the happy one of preventing the cylinders from being burdened with water of steam condensation. The maximum pressure upon these boilers being 95 pounds to the square inch, while the maximum pressure on steam cylinders is 60 pounds to the square inch, steam cut off at one-third the length of stroke and worked expansively the remaining two-thirds.

The non-condensing engines, two in number, have each a cylinder whose bore is 45 inches diameter and 8 feet length of stroke, having duplex, or balance, valves of 11½ inches and 10½ inches diameter, with corresponding valve chambers and piping of ample proportions, and fully adapted to a free and easy flowage of steam to the cylinders. The steam-pipes have an internal diameter of 15½ inches.

Both engines are worked from a single battery, of duplicates at all times, by means of a cross-connecting steam-pipe of 15½ inches internal diameter, and the valving on each battery was originally of the same dimensions; and before the cross steam-pipe was instituted, each battery was fired for its accompanying cylinder.

During the past year the boiler valves have been reduced from 15½ to 7⅞ inches, say one-fourth the area, for a single engine as originally used, but only one-eighth the area as at present used for both engines. It is worthy of remark, that no change has been produced in the working of the engines.

With the foregoing practical illustration, without the aid of science, it is no difficult matter to conjecture the heavy loss sustained by the works for unnecessary large radiating surfaces passing off large volumes of

valuable caloric without producing any beneficial effect whatever. Where high velocity, or great effect must be produced regardless of cost of working, such proportions may be pardonable, but in machinery for supplying cities with their most essential element, and at the lowest possible rate, such construction should be at all times avoided, and all parts conducting the steam directly from the boilers to the steam cylinder, should be proportioned to the natural requirements of the labor to be performed, and as much compacted as practicable, for good and effective working, as prudence and practice may dictate.

THE AQUEDUCT FOR NEW BUILDING.

The low water of the past year, although too late in its appearance, presented an opportunity which occurs only at intervals of years for pushing forward this most important portion of the new works now in progress, all other matters became subservient to this only object of interest, which, after various perplexities and uncontrollable circumstances, was brought to a successful completion on the 23d of November. The entire length of this structure is 158 feet 8 inches; the side walls 36 inches in thickness, with a hight at the mouth of 7 feet 5 inches, gradually rising in hight from the river to the valve room, to 9 feet 4 inches. Upon these walls is sprung an arch of 21 feet 1 inch span, and a rise of 10 feet 1 inch, the base of arch commencing with a thickness of 36 inches and gradually tapers to the top, having a thickness of 24 inches on top of the arch; seven openings are formed at regular intervals for the removal of sedimentary deposite, around which are walls of 22 inches, the openings being 4 feet 6 inches; the hight of the curbings are variable from 20 inches at the mouth of aqueduct to 13 feet 4 inches at the upper end next to valve room, forming a curved inclined gradient of 24 inches spring at the center; the curbs are capped with a cast-iron plate, permanently placed on the masonry with internal flangeing of 6 inches depth, and external of 3 inches. The apertures are protected with cast-iron movable covers.

The face work in the channel of the river is constructed with walls of 5 feet thickness, 20 feet high, and face length of 85 feet; the upper or up stream portion of the face, forming a break-water for the purpose of repelling the shore water from the strainers of the aqueduct, has a length of 31 feet 6 inches, the upper end falling back on an angle of 25 degrees. This wall rests on a natural table, or flat rock, lying not more than 15 inches below low water mark. At the termination of this angle, an intersection is formed with the face of aqueduct of 27 feet one inch in length, carrying a cast-iron facing on the arch, supported on columns and plate-work, forming nine compartments for the reception of the strainers and frames. The lower bed plate of this work rests on a wall of 14 inches in depth, built on the solid rock which supports the entire aqueduct. This ledge of rock which underlies the low water table rock to a depth of 7 feet, forms the bottom of the aqueduct, as also the chute entering the river channel, where the water at the lowest known stages measures over 15 feet.

Below the face proper of aqueduct, the wall is extended to the distance of 26 feet 5 inches, having a similar angulation to the break-water, and is supported at its lower extremety by a retaining wall 20 feet in length, 11 feet 6 inches high, and 5 feet thick; the top covered with Dayton stone coping, and firmly bonded with wrought-iron clamps. The top walls of aqueduct also carry a coping of 11 inches thickness, 5 feet 1½ inches wide, and mean length of 61 feet 7 inches. Within the aqueduct rests the 60-inch wrought-iron inlet pipe, supported upon stone pillars of 4 feet in length, of base and intervals of 4 feet throughout its entire length, from its connection with cast-iron pipe projections 18 inches beyond the valve room.

The inlet pipe is composed of four pieces, measures in all over 160 feet, and at its terminus beyond the face of aqueduct carries a flanged collar for the reception of a grooved collar of semi-circular formation, consisting of two pieces, carrying 24 bolts, and firmly bolted to the flange on mouth-piece, for the purpose of producing a quarter revolution of mouth-piece; the main body of which is the same as inlet pipe, say 60 inches diameter by 12 feet long, the end being closed with a cast-iron head, having an opening in the center of 12 inches bore, for the reception of a cast-iron journal, which is firmly bolted to a heavy angle plate of cast-iron, fimly anchor-tied with plates and bolts to its surrounding masonry, resting upon the extreme edge of the river channel.

The side opening of mouth-piece measures 5 by 8 feet square, the 5 feet length being enlarged to 6 feet (vertical) in the length of 10 feet 6 inches, while the 8 feet (horizontal) is increased to 14 feet in the same distance, (say 10 feet 6 inches,) giving to the face of the mouth-piece a strainer surface of 6 by 14 feet, the strainer facing down stream and transverse to line of inlet pipe facing.

The cost of this structure, now completed, is as follows:

For excavation of 6,311 yards, mainly through rock and soap-stone, and requiring a large amount of blasting,.....	$2,814 42	
Earth fill over aqueduct,.....	1,520 06	
Bell & Valentine's bill of stone,.	350 85	
Stone furnished by Mathers & Co.	1,284 42	
Sand, lime, cement, and labor of masons,..	7,150 00	
Iron castings—44,446 pounds,..	1,583 39	
Forging bolts, strainer bars, etc.	290 62	
Bills for Dayton stone and freight.	224 25	
Total cost of aqueduct.....		$15,218 01
Inlet pipe, mouth-piece and placement of same, also Champion No. 4's bill of drainage.....		9,082 99
Total cost of aqueduct, inlet pipe, mouth-piece, etc., etc.....		$24,301 00

STAND PIPE AND MAIN AT RESERVOIR.

On March 15, 1862, a commencement was made on excavation for stand-pipe and cast-iron portion of main, running alongside of reservoir at the west of same and continued to center of High street, with 40-inch branches to connect with the 40-inch main to be taken from reservoir down High street, along Lock street and Eighth to the intersection of Broadway and Eighth street.

This labor has been both tedious and expensive, as blasting could not be resorted to on account of the excavations being contiguous to, and some six feet or more below, the foundations of the reservoir. The large size of new pipe, as also the size of main to be connected with it, (say 40 inches,) could not be carried over the old lines of 20-inch, hence it has been located below them. 798 yards, mostly of soap-stone, has been wedged off, or picked, and wheeled out into High street, and then loaded into carts for filling over the new aqueduct.

The cast-iron pipes have been put in place one at a time, and then walled in prior to an extension of the excavation. Such is the treacherous character of this formation upon which the reservoir stands, that too much care cannot be exercised for safety of this work, upon which so much depends.

The line of cast-iron pipe, with stand-pipe base and stop-gate, now laid and walled in, amounts to 162 feet 10 inches, and vertical column in place and walled in, say 21 feet 9½ inches. The stand-pipe foundation has been brought up to the earth's surface, and measures 16 feet 6 inches square. There yet remains one piece of cast pipe of the vertical column to be drilled and put in place; the residue of the work will be made of wrought iron, say three 20-feet lengths of 60-inch pipe, to be placed on top of the cast-iron piping now in place.

The following is a brief statement of this work, as far as finished:

Entire weight of iron castings, 323,789 pounds, and cost, say	$11,490 20	
824 1¼-inch and 1-inch bolts...	227 20	
Excavating for stand-pipe and main.....	968 35	
413 perches of stone—cost.....	519 48	
Mason's labor, cement, lime and sand,.....	747 27	
Total for labor, material, etc.....		$13,952 50

The valve room, in immediate connection with the aqueduct, is complete, requiring only 40 perch of stone to finish this division. When finished, embracing stone furnished by the works from excavations and by Mather & Co., it will contain 763 497-1000 perches. This valve room will be furnished with a well-hole with water-tight cover and boltings.

OFFICERS OF THE CINCINNATI WATER-WORKS, FOR 1863.

Board of Trustees,
CHARLES RULE, *President.*
M. ECKERT,
JOSEPH TORRENCE.
Superintendent,
THOMAS J. WEAVER.
Engineer,
GEORGE SHIELD.
Secretary,
J. M. HANSON.
Collectors,
District No. 1—G. B. WILLIAMS,
" 2—V. EICHENLAUB,
" 3—ALEXIS KEELER,
" 4—FREDERICK BLUMM.

SANITARY REFORMS.

The report of the City Inspector for 1862 asserts that the sanitary condition of New York is superior to that of London, and that this city is actually more healthy than any other great metropolis in the world. Whatever gratification we may feel on that account is considerably alloyed by the disclosure of the sanitary necessities and deficiencies still existing, which are so important that the comparison with London is rather a suggestion of the wretched condition of that city than an assurance of any positive merits among ourselves. That this, as well as every other city, is far behind the standard which sanitary science endeavors to establish, that it neglects the most ordinary precautions, and suffers the most frightful abuses to continue, is so true and has been so repeatedly proved that it may seem hopeless again to direct attention to the facts. But in this, as in other reforms, progress is gradual, not sudden, and approach to perfection is only possible through long avenues of unceasing effort and reiterated admonition.

We shall do well to dismiss from our minds the habit of comparison with other cities, except as a stimulus to improvement. As a source of self-congratulation, it is mischievous and deceptive. Here are certain manifest, admitted nuisances in this city, injurious to property, destructive to decency and comfort, and ruinous to health. It is wiser to try to remove them than to console ourselves with the belief that as bad or worse may be found in London and Paris. Consider two or three instances.

Six thousand families in New York live in underground cellars, without air, without light—undrained receptacles of stagnant water, in which decent cleanliness is nearly impossible, and tolerable health wholly so. These cellars not merely shorten the lives of their occupants; they are a pest to the districts where any of them are permitted to exist. They present a case entirely accessible to reform; indeed in London, to which we are so superior, they are already under ban. In that city the use of cellars as dwellings is prohibited unless they are of specified dimensions, and are provided with a fire-place and a window that will open. It is in the power of the Common Council to establish similar regulations in New York, and in an easy and inexpensive way to close a prolific source of disease and crime.

Tenement houses are but little improved since their horrors were first revealed. As in the underground cellars, more space, more air, more light, and the most ordinary conveniences for cleanliness are required to make them fit for human dwellings, and the enforcement of some internal police regulations for sanitary purposes is still opposed or neglected by the cupidity of owners, indifferent to any system of improvement except in the matter of rents and their prompt payment. Legislative authority is ample for reform, but is appealed to in vain. When landlords learn the fact, now beyond dispute among scientific inquirers, that it is the best class of cheap tenements which yields the surest and largest income, they will undertake for their own interest what no motives of humanity can induce them to attempt for their tenants.

Sewerage and drainage, the two necessities which underlie all possibility of sanitary reform, have been perhaps more considered by the city authorities than any questions relating to health. What is needed is, a system. Never was a city more favorably situated than New York for the adoption of a complete as well as extensive plan, which, at a modarate expense, would surely decrease the rates of mortality. If it be impossible now, or undesirable, to commence anew throughout the city, it is at least practicable to enfore a compliance with a few simple regulations among all estates bordering on sewers already existing, and, what is of still more importance, to construct in future sufficient sewers in all new streets before they are opened or built on. Marsh lands and sunken lots in the upper part of the city have a not less injurious influence on health than the gathered corruptions in its more crowded portions.

It is, of course, useless to say anything on the subject of street cleaning. To suppose that the streets of New York will sometime be really cleaned, as that word is elsewhere understood; to suppose that a contract that had anything to do with streets will ever be drawn in the interest of the city, and, if drawn, enforced; to suppose that there *could* be such a person as an honest contractor—these are too manifestly Utopian dreams and millenial visions. But considering the subject only in its sanitary relations, remembering the pestilence that exhales into the air and penetrates every house and the system of every human being exposed to it, remembering that no reform is of more perilous necessity than this of street cleanliness, and that probably no large city in Christendom is to be compared with New York in the absolute, untouched, inconceivable filth of its streets all summer long, might we not profitably postpone for the present the assumption of sanitary superiority to London and Paris? In Paris, Mr. Hackley would be impossible. In New York the population which breathes the air he poisons would be amazed to hear that an earnest effort was making to bring him to justice.

The city still tolerates slaughter-houses and fat-boiling establishments, even in its thickly-peopled districts. We should like to say that it is incredible, but it is asserted in the Inspector's report that their number is constantly increasing. In place of the slaughter-houses, the well-known system of abattoirs in Paris might easily be adopted, with the best results to the health of the city, and with injury to none except those who desire to preserve their pecuniary interests at the cost of discomfort and disease to the population of the city. Fat-boiling and bone-boiling establishments ought no more to be suffered to exist on this island than stagnant lakes or pestilential swamps, Illness and death hold carnival all around them. Their owners are enemies to society, and might very properly be banished together with the nuisances they perpetuate.

The millions of people who, during the year, are compelled to ride in the horse-cars will appreciate the force of the suggestion that their over-crowding and want of ventilation are sure causes of disease. Perhaps the extent of the evil is not realized because it is transient, but it is to be remembered that it occurs too frequently to be harmless. If you shut up forty human beings in a space meant for twenty, and compel them to breathe slow poison for one hour a day, it is not in the constitution of mortal man to resist its effect forever. The same is true of ferry-boats, the cabins of which are never properly ventilated, are generally unclean, and frequently filthy. It is obvious that in the case of railway and ferry corporations there is no excuse for these outrages on public health and comfort. They will probably be done away with when corporation managers are made to understand that the franchises which they administer were granted for the public benefit not less than for the profit of stockholders.

Into the merits of the controversy between the Inspector's Department and the Police we do not enter. There is work enough for both without conflict of jurisdiction or interest. Neither does all that is possible. The Common Council, with more extensive duties and means, does still less. The People, with unlimited powers over the whole subject, does least of all. Those who, in contemplation of law, are the servants of the people, are no doubt unfaithful, but the final responsibility rests with the people themselves, who are too indolent, too absorbed in personal interests, too accustomed to believe that the administration of the public affairs of the city must necessarily repose in the hands of swindlers and imbeciles, to make an effort for reform. It is our duty to remind them of theirs.—*N. Y. Tribune.*

PETROLEUM ITEMS.

Oil Well in England.—An oil well has been discovered near Blaina, Monmouthshire, England. A person was pumping from a newly constructed well fifty feet deep, when he noticed oil coming up with the water. The oil has not yet been subjected to chemical analysis, but when a flame was applied it ignited readily and burned brightly. It is rather thick, and has a peculiar smell. Excavations in the vicinity of the well show the soil to be of a boggy nature.

New Wells in the Canada Oil Region.—The Oil Springs *Chronicle* says that a few days ago a new well was struck by Messrs. Pope and Penton, at the depth of 184 feet from the surface. The capacity of this well is about 50 barrels per day.

The Duncan well, which had for some time past ceased to yield, is now yielding forty barrels per day.

The Bothwell Oil Region.—The London *Prototype*, in a letter from a correspondent in Canada, thus speaks of the Bothwell region:

"It has long been known that the section of country between Wardsville and Moraviantown, on the right bank of the Thames, gave indications of the existence of oil. Various attempts have been made during the last three years to test the richness of this region in the greasy fluid, but circumstances incident to experiments of this sort have tended to damp the ardor of the explorers, and to protract the final demonstration. This, however, took place a few days ago, when oil of a very pure and superior quality was obtained, and the well is now yielding from 180 to 200 barrels per day. * * * * * *

"The well is close to the town line, between Mosa and Zone, but in the township of Zone, in the county of Kent, within a few rods of the river, and about two miles from the Bothwell station, on the Great Western Railway. * * It is a joint stock affair, one half being owned by gentlemen in the neighborhood, and the other half by Messrs. Jordan and Lick.

"The depth of this well is 224 feet, and the materials bored through, as given by the workmen in charge, are the following: surface sand, 5 feet; clay, 55 feet; cement gravel, 8 feet; ordinary gravel 2 feet; hard clay, 25 feet. At this depth, 95 feet, a very powerful jet of gas was struck. Hard clay with gravel, 49 feet; very hard cement gravel, harder than rock, 12 feet; hard, dry sand, 19 feet; soft white stone, 6 feet—here oil was found at a depth of 181 feet—lime stone, 10 feet; hard, light stone, 4 feet; hard, dark-colored stone, 4½ feet; soap stone, 20 feet; hard, black stone, 2 feet. This is where the oil is obtained. Mr. Kettleworth, a practical chemist and refiner, is about to erect a refinery at Bothwell. This fortunate experiment will give an impetus to business in this part of Canada, and will, no doubt, invite capital and enterprise to the development of the mineral riches of this part of the peninsula."

The Welsh Oil Spring.—The London *Builder* says that the paragraph which lately went the rounds of the English journals, and was copied into several papers this side of the Atlantic, our own among the number, relating to the discovery of an oil well at Blania, Monmouthshire, requires a little explanation. The only spring, it now turns out, was a hogshead of oil which sprang a leak some time since near the spot, and by some means a portion of the oil got into the well; hence the discovery of the supposed oil-spring.

This is very much like some developments which occurred in Pennsylvania when the oil fever was at its height. One or two frauds were perpetrated and lands sold on which wells were situated which had been filled with oil for the purpose of effecting a sale.

Petroleum for Lighthouses.—At the last meeting of the Liverpool Dock Board, the marine committee ordered tenders to be invited for the supply of 4,000 gallons of refined olive oil, and 1,000 gallons of rape oil.

Mr. Graves believed the Mersey Board were the only lighthouse authorities in the kingdom who used olive oil. Colza oil was cheaper, and quite as useful for lighting purposes as olive oil. He did not know whether the chairman of the marine committee had been looking into the matter or not, but he mentioned the question not for the purpose of finding fault or raising an objection to the proposal of the committee, but in order that the whole subject might be looked into.

Mr. Boult would like to say a word in favor of petroleum, on the same ground that Mr. Graves had advocated colza oil. Petroleum oil was 1s. 9d. a gallon, or only one-half the price the board were paying for olive oil, whilst the former would give a better light and work in a cleanlier manner than the latter. Petroleum had been before the public for two years, and it was rather hard that the marine committee had not given it a trial so as to see what it would do. He believed that colza and petroleum should both be tried.

Mr. Darbyshire said the new lights would all be lit with colza or rape oil; but it had been found by previous experiments that it was much better to use olive oil. At the same time, the committee would be glad to have as cheap an oil as possible. As to petroleum, he could only say that the committee would go into the subject and see what could be done.

The Chairman suggested that Mr. Graves should attend the meeting of the marine committee on Tuesday, ond give that committee the benefit of his valuable suggestions. With regard to petroleum, he believed it evaporated very fast.

Mr. Brocklebank understood the reason why olive oil was used was that it was better suited to the particular form of the lamps and reflectors at present in use than any other description of oil.

Mr. Darbyshire replied that that was the case, but with the new lamps the board could use colza oil.—*London Grocer.*

High Art.—The editor of the London *Journal of Gas Lighting* has been recently entertaining his forty-nine readers with a very digressive article on "high art," in which paper-hangings and fenders, inkstands and park gates, jewelry and porcelain manufactures, tea-pots and tea-cups, and "English gentlemen's clothes," are jumbled up in a very ludicrous manner, and one hardly knows how to account for the incongruous array of dissimilar articles set in such close juxtaposition. *Pater familias*, however, gives us an inkling of his unmeaning talk, by alluding to British sculptors as being "good at (on) a bust, but not one has one spark of genius." Perhaps our learned progenitor, in his obfusticated state, imagined himself a sculptor, in which sense we must understand him to have referred to himself as "good on a 'bust,' but having not one spark of genius." Pity that the old gentleman should have so far forgotten himself as to make such a humiliating confession! However, truth is mighty and will prevail.

Warren, Ohio.—The paragraph in our last issue relating to the fact that the Ohio Legislature had passed a bill authorizing the town council of Warren to levy a tax for the purpose of building, owning, or buying gas-works, may have led to the belief that new works were contemplated. Such, we believe, is not the fact. The Warren works were built by Mr. W. D. Parrish, of Philadelphia, and although no overtures have been made by the Company for the sale of their works, some restive people in the town have conceived the idea that the works ought to be owned by the city. We hope they will see their mistake before it may be too late.

Gas in Wales.—A special meeting of the directors of the Cardigan Gas-light Company was recently held to consider the report of Mr. Andrews, of Swansea, the civil engineer engaged by the company to examine the plans which had been sent in by the various contractors who had proposed to complete the works. The mayor, Mr. Davies, presided. It appeared from the report of Mr. Andrews that the plans submitted by Messrs. Vickery were the best adapted for the town, but that these plans required some alterations. The meeting required that they should be sent back for amendments, when they will probably be adopted.

PATENTS.

UNITED STATES

38,149.—G. F. J. Colburn, Newark, N. J., for a Lamp:

I claim the reservoir, A, having the arms or projections, a and b, so formed and combined with it as to support and supply with oil more than one burner, simultaneously, as specified.

I claim the application of the cap between the burners for the object specified.

38,150.—G. F. J. Colburn, Newark, N. J., for a Lamp Chimney:

I claim the method of connecting a tube with a lamp or gas-burner by means of a fixture made and attached as described, so that it may be combined with or removed from a glass globe or other transparent device protecting the flame, substantially in the manner and for the purpose specified.

38,157.—E. Elliott, Petaluma, Cal., for a Pump:

I claim the forming of the induction and eduction tubes, A B, of a series of wooden pieces, a, bored longitudinally and connected together, substantially as shown, in combination with the pump cylinder, D, attached to one of said pieces, a, and communicating with the tubes, A B, as shown and provided with the piston, F, all arranged to operate as described, the above parts being used with or without the air vessel, C.

38,162.—H. W. Hayden, Waterbury, Conn., for a Lamp:

I claim the circular wick and tube, c, in combination with the deflector, h, slotted as specified, and with the glass chimney, g, having a draught space between the base of said chimney and the deflector, for the purposes and as specified.

I also claim the perforated air-distributer, e, in combination with the said circular wick, c, slotted deflector, h, and glass chimney, g, for the purpose of regulating the action of the air, as set forth.

38,163.—H. W. Hayden, Waterbury, Conn., for a Reflector for Lamps:

I claim a reflector or shade surrounding the lamp chimney in combination with the spring ring and hinges, as set forth, so as to allow of the inclination of said shade or reflector as specified.

38,170.—C. B. Lasher, New York City, for a Lamp:

First, I claim the wick case, g, extending from the wick tube and gradually supplied with oil or fluid from the reservoir through a small hole, 2, or its equivalent, as set forth and for the purposes specified.

Second, I claim the cap, d, attached directly to the surface of the reservoir itself in combination with the vent, 1, for the purposes set forth.

Third, I claim the screw rod, k, and hole, 3, in combination with the wick case, g, for regulating the supply of oil to said case, as set forth.

38,180.—Timothy Rose, Cortlandville, N. Y., for a Scroll for Water-Wheels:

I claim the movable gage piece or false side, D, to the scroll in combination with one or more trap or stop gates, C, as above described and for the purposes set forth.

38,189.—F. G. Tucker & A. Crawford, Albany, N. Y., for a Lantern:

We claim, first, The cells, s s, with the shelf, m, in cylinder, E, and the cells, t t, with the shelf, n, in the cylinder, B, for the purposes set forth.

Second, The partition, p, with the openings, y, in cylinder, B, to shield the heat from the cap of the lantern.

Third, The cylinder, D, with its orifice, k, and slot, v, arranged to slide within the cylinder, E, so as to accommodate the shaft, k, of the wheel-wick trimmer, in combination with the cells, shelves and partition aforesaid.

Fourth, The springs, e e, as arranged to secure the cylinders, D and E, to each other in combination with said cylinders and with the cells, shelves and partition as aforesaid.

Fifth, The combination of the whole lantern as represented and set forth, embracing the said cells, shelves, partition, cylinders, orifice, and slot and springs, as applied to any of the lamps and burners now in common use, the whole to be made as represented and for the purposes herein set forth.

38,199.—P. J. Clark (assignor to S. S. Clark), West Meriden, Conn., for a Coal-oil Lantern:

I claim the peculiar construction and arrangement herein shown and described, of the jacket, H, in combination with the lamp, E, and burner, G; so that while the lower part of the air-duct is open and free, the upper part or space, d, will be narrow and thus compress the air into a thin sheet, and cause it to shoot with increased velocity into the interior of the burner, all as set forth.

38,208.—Samuel Adlam, Jr., and Jeremiah R. Fogg, Portland, Maine, for a Kerosene Lamp:

We claim the band, D, in combination with the pivoted coneplate, I', and cap, C, substantially in the manner and for the purpose set forth.

38,209.—Abraham Arnold, Heidelberg, Pa., for a Pump:

I claim a double-acting force pump having the connecting rod, A, of the lower sucker to work through the upper sucker at F, when operated by the double crank, represented by Fig. 2 at C C, the whole as shown and described.

38,223.—Solomon Frederick, New York City, for a Coal-oil Burner:

I claim, as an improved article of manufacture, the top, D, when made in the peculiar form and manner herein shown and described, and applied to the tube, C, as set forth.

38,226.—Jonas Holmes, Clayville, N. Y., for a Water-Wheel:

I claim the employment or use, in an overshot breast or any bucket water-wheel, of perforated bottoms, D, to the bucket so arranged as to operate in the manner and for the purpose herein set forth.

38,334. — Arthur McCarter, Norristown, Pa., for a Pump:

I claim, first, The combination of the three-faced valve, moved by the water, with the valve seat and the auxiliaries thereto, the whole constructed and operating substantially as and for the purpose described.

Second, The three-faced valve in combination with the five ports, substantially as described.

38,263—Anson Judson, Brooklyn, N. Y., assignor to himself, Lemuel Beers, Newtown, Conn., and Fred. W. Beers, Brooklyn, N. Y., for a Coal-oil Lamp:

I claim the construction of the cone of a flat-wick kerosene, petroleum, or coal-oil lamp, partly of transparent or translucent material, and partly of metal; the two being combined together as hereinbefore set forth, or in manner substantially equivalent.

38,268.—Samuel S. Williams (assignor to Henry J. Bailey), Pittsburgh, Pa., for a Water-Elevator:

I claim the partial covering to the top of a tilting well-bucket with an opening on each side of the bale, substantially as described.

Also, the yielding trip for tilting the buckets, constructed and arranged substantially as described, that is to say, having its center of motion below the point at which it first comes in contact with the top of the buckets, and hence descending in the line of an arc of a circle as it is carried over the trough.

Also, in combination with the yielding trip, the hooks or other equivalent device to engage the trip, when placed back of the mouth or opening in the buckets for the discharge of the water, so that the water, as it is discharged from the bucket, shall not run over the hook and trip, substantially as described.

38,269.—Enoch Osgood, Boston, Mass., for Self-balancing and Self-closing Faucets.

I claim, first, A valve and a diaphragm connected together and arranged as herein described to hold and resist any pressure of fluids that may come between them to pass out through the valve for use, the diaphragm to be any degree larger than the valve requisite to give it any closing power wanted, the valve closing against the current of water, when relieved of the action of the lever, K, or its equivalent.

Second, In combination with the foregoing, an adjustable graduating pressure, attached to resist the closing of the valve as desired for water-closets, and other purposes, substantially as and for the purpose herein described.

38,270.—J. A. Thompson, Geneva, N. Y., (antedated Nov. 29, 1861,) for a Filter:

I claim a filter and cooler for water and other liquids constructed and arranged and operated substantially as described.

38,284.—Mills L. Callender, New York City, for a Lamp:

I claim, first, The use and application of vulcanized india-rubber, gutta-percha, or similar material, as a lamp body, or the receptacle for oil, in combination with a wick-tube and burner.

Second, I claim attaching the handle to the top of a lamp or burner, in the manner substantially as described, by a groove loop-spring and hook-catch, F.

Third, I claim securing the chimney-holder and appliances to the lamp or burner by a spring, for the purposes and in the manner substantially as represented; also, combining the spring and handle substantially as represented.

Fourth, I claim using a horizontal slide, or spring-slide, attached to the chimney holder, for the purposes and in the manner substantially as represented.

Fifth, I claim the perforated cup, B, for the purposes specified.

Sixth, I claim the cover, J, to the perforated cup, B, when used in the manner and for the purposes substantially as described.

Seventh, I claim a corrugated metallic chimney-case, arranged in the manner and for the purpose substantially as described.

Eighth, I claim, broadly, a lamp chimney-cap, N, or draught protector as described, or its equivalent.

Ninth, I claim a metallic reflector to a lamp, with an orifice in its center for the chimney to pass through.

Tenth, I claim a centrally perforated metallic reflector to a lamp, in combination with a suspensory or adjustable holder, or attachment, whereby the reflector is secured to the chimney at any height.

Eleventh, I claim a brevet metallic, combined reflector and shade, for the purposes and in the manner as described, substantially.

Twelfth, I claim a suspensory shade or reflector holder and slide, substantially as described, when formed or cut from one piece of metal.

Thirteenth, I claim the formation of the deflector or diaphragm, L, where the opposite sides of the round flame orifice are raised or convex, so as to flatten the flame of a round wick.

Fourteenth, I claim a lamp arranged with any or all the improvements, substantially as described.

38,291.—Lewis H. Davis, West Chester, Pa., for a Pump:

I claim, first, The hollow cylinder, G, arranged within the barrel, A, between the cover, b, and packing, H, substantially as and for the purpose herein set forth.

Second, In combination with the packing, H, cylinder, G, and its projection, h, I claim the gland or follower, d, the whole being so arranged and constructed that the packing for the piston and piston-rod may be tightened simultaneously by forcing the said follower, d, in the cover, b.

Third, the chambers, K K' and L, with their respective valves and openings, the whole being arranged in respect to each other, and to the chambers of the barrel, to the air vessel, and to the suction pipe, substantially as set forth.

38,302.—George Finley, Collins Township, Pa., for an Adjustable Lamp:

I claim constructing and arranging the wick-tube in relation to the burner and cone or cap of lamps, substantially as hereinbefore described, so that the wick-tube may be depressed at pleasure, so far as to bring the top of the wick below the base of the cone, or cap, and away from the influence of the draft, produced by the cone; the burner frame, below the cone, being furnished with an opening, or openings, through which the wick can be lighted or trimmed, for the purposes hereinbefore set forth.

38,303.—Orlando V. Flora, Cincinnati, Ohio, for a Carbon-oil Lamp:

I claim the corrugated body, or case, C, of perforated metal or material, substantially as and for the purposes herein specified.

I also claim the concave flange, D, in combination with the corrugated, perforated body or case, substantially as and for the purpose herein set forth.

GAS-BURNERS.

T. G. ARNOLD,
MANUFACTURER OF
GAS-BURNERS,
And Importer of SCOTCH TIPS,
No. 447 BROOME ST.,
Second door west of Broadway, New York.
Mercury Cups, Portable Sockets, Burner Pillars, Burner Pliers &c., &c.

ORNE'S PATENT FILTER REGULATING GAS-BURNER,
Admitted by all practical and scientific men who have examined its movements, to be
THE BEST GAS-BURNER YET INVENTED.
They are
Self-Regulating,
Gas-Purifying,
Indestructible, and
Most Economical.
For sale by—
S. A. STETSON & Co.,
350 WASHINGTON STREET,
Boston, Mass.

C. GEFRORER,
Manufacturer of
GAS-BURNERS,
For Lighting and Heating Purposes.
GAS HEATING AND COOKING APPARATUS; FITTERS' PROVING APPARATUS, &c.
No. 111 South Eighth St.,
Philadelphia.

PETROLEUM GAS.

THE AUBIN GAS-WORKS COMPANY, OF ALBANY, N. Y., have adapted their Works to petroleum and the heavy oil obtained from its distillation. Parties desiring information will be referred to Village Gas-Works thus adapted, where the ordinary yield of gas is from 150 to 200 cubic feet per gallon of oil. This yield, and the great improvements which experience has added to the Aubin Works, enable them to make a rich gas at a low cost—the only way to compete with kerosene.

STEAM-PUMPS.

WORTHINGTON'S STEAM PUMPS, extensively used by Gas-Light Companies. For Sale at greatly Reduced Prices.
Also, a new and highly successful Pump, driven by water pressure, requiring no attention or repairs, and the most economical water motor yet constructed.
Patent GATES, for Water and Steam-stops.
HENRY R. WORTHINGTON,
61 Beekman street, N. Y.

WEST'S IMPROVED PUMPS, the most Simple, Durable, and Powerful, and the Cheapest in use.
J. D. WEST & CO.,
179 BROADWAY, N. Y.

ANALYTICAL CHEMIST.

C. ELTON BUCK,
Analytical and Consulting CHEMIST,
39 NASSAU STREET, NEW YORK,
Analyses of Ores, Minerals, Soils, Guanos, Coals, &c., and Tests of Commercial Articles, carefully and promptly made. Consultations may be had, and opinions given on Chemical questions. Samples for analysis from a distance, may be sent by mail or express, directed to the Laboratory as above.

PHOTOMETER APPARATUS FOR SALE.

A COMPLETE BUNSEN PHOTOMETER apparatus, with portable room, connections, joints, clock, experimental meter, scales and weights. The whole apparatus is in perfect order, and is adapted for the most delicate scientific investigations.
Apply at the Rooms of the AMERICAN GAS-LIGHT JOURNAL,
No. 39 Nassau St.,
Corner of Liberty St.
New York City.

GAS & WATER-METERS.

JOSEPH LENNIG,
1615, 1617, and 1619 Francis St.,
Above Ridge Avenue, Philadelphia, Pa.,
MANUFACTURER OF
WET & DRY GAS METERS,
STATION, SHOW, & EXPERIMENTAL METERS,
Photometers, Pressure Registers, Indicators, and Gauges, Governors, Meter Provers, Centre Seals, Fluid Gauges, &c.
GAS APPARATUS
Of the most reliable and approved construction manufactured and on hand at the
UNION GAS METER WORKS.

H. R. WORTHINGTON'S
PATENT WATER-METER.
This Meter combines
ACCURACY,
SIMPLICITY, and
REMARKABLE DURABILITY,
with such ease and certainty of motion, as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our largest cities.
HENRY R. WORTHINGTON,
61 Beekman street, N. Y.

CLARK'S PATENT STEAM AND FIRE REGULATOR Co., sole Patentees and manufacturers of CLARK'S PATENT STEAM AND FIRE REGULATOR, No. 5 PARK PLACE, New York.
W. H. PERRINE, Pres.

FINANCIAL.

JOHN MOSS, Jr.,
BROKER,
83 WALL STREET, NEW YORK
Particular attention given to the negotiation of GAS-LIGHT and WATER COMPANIES SHARES and BONDS.

ALBERT H. NICOLAY,
STOCK BROKER AND AUCTIONEER,
No. 52 William Street,
NEAR WALL ST., NEW YORK.
Special attention given to the Buying and Selling of Gas-Light Companies' Stocks.

JOHN B. MURRAY,
No. 39 NASSAU STREET,
Opposite the Post Office, NEW YORK,
OFFERS FOR SALE
GAS-LIGHT STOCKS
In all the leading Companies.

GAS-FIXTURES.

Mitchell, Vance & Co.,
MANUFACTURERS OF
CHANDELIERS,
And every description of
GAS FIXTURES,
WAREHOUSE, No. 620 BROADWAY.
MANUFACTORY,
Nos. 335, 337, 339, 343 WEST 24TH STREET,
New York.

GEORGE H. KITCHEN & CO.,
Manufacturers of
Fixtures for Gas-Light Purposes,
Wood's Building, No. 561 Broadway, New York.
Office of the Inspector of Gas Meters for the State of New York.

VAN KIRK & CO.

Manufacturers of

CHANDELIERS, GAS FIXTURES, &c.,

Bronze Figures & Ornaments, Porcelain & Mica Shades,

COAL OIL BURNERS,

HAND LAMPS, COLUMNS, &c.,

No. 517 ARCH STREET, PHILADELPHIA.

Factory at Frankford, Philadelphia.

ALL GOODS WARRANTED.

DIETZ & CO.,

MANUFACTURERS, IMPORTERS AND DEALERS IN LAMPS,

And all Goods appertaining to the Lamp Trade,

132 WILLIAM STREET, NEW YORK.

PATENT AGENCIES.

SCIENTIFIC AMERICAN OFFICE, NEW YORK CITY—37 PARK ROW, WASHINGTON, D. C.—F AND 7TH STS.

MESSRS. MUNN & CO., publishers of the SCIENTIFIC AMERICAN and Patent Solicitors for the last seventeen years, would announce to the public that they never possessed better facilities for obtaining Letters Patent and transacting all kinds of business before the Patent Office than they now have.

During the *seventeen years* they have been engaged in procuring patents they have acted as Attorneys for more than SEVENTEEN THOUSAND patentees. Nearly one-third of all the applications for patents annually made in this country are conducted through the "Scientific American Patent Agency," and nearly all the patents secured abroad by American citizens are taken through this Office.

In making an application for a patent, all the inventor is required to do is to furnish a model with an explanation of the operation and advantages claimed. The drawings, petition, specification and other papers are prepared and presented at the Patent Office by MUNN & Co., who have a large corps of engineers, draughtsmen, specification writers and copyists in constant employment. Papers prepared at short notice.

Pamphlets of instruction, announcing the amount of fees, size of model, and other information as to the best made of obtaining patents in this and all foreign countries, are furnished free on application. For further particulars address

MUNN & CO.,
PUBLISHERS OF THE "SCIENTIFIC AMERICAN,"
No. 37 Park Row, New York.

ESTABLISHED 17 YEARS.

OFFICE FOR THE PROCURATION of Letters Patent and the Registration of Designs. JOSEPH WILLCOCK & CO., Patent Agents and Engineers, successors to Messrs. BARLOW & Co., 89 Chancery Lane, London, W. C.

Gratis and post free, "The Inventor's Manual," also a pamphlet, "L'Obtention de Patentes Anglaises," 500 Mechanical Movements; the first part of Kinematics, or the Transformation of Motion, by Joseph Willcock, C. E., Mem. Soc. of Eng. May be had at the above address, and of any bookseller. Price 2s. 6d.

The second part is approaching completion and will shortly be announced.

MESSRS. J. WRIGHT & CO., CONSULTING ENGINEERS and SOLICITORS of PATENTS, No. 42 Bridge street, Blackfriars, London, E. C. Patents for inventions obtained in all countries where Patent Laws are in force.

J. N. McINTIRE, PATENT ATTORNEY and SOLICITOR OF AMERICAN AND FOREIGN PATENTS,
Office, No. 37 PARK ROW,
New York City.

F. C. TREADWELL, JUNR., SOLICITOR OF PATENTS,
And expert in Patent Cases, 335 BROADWAY, (Moffat's Building.) New York.

AMERICAN AND FOREIGN PATENT AGENCY, Established 1838. Letters Patent for New Inventions procured in the United States, Great Britain, France, and other countries. LEMUEL W. SERRELL,
119 & 121 NASSAU ST., New York.

WOOD GAS.

THE INVENTOR AND PATENTEE of a New and Improved Retort for Manufacturing Gas from Wood, Turf, &c., would call the attention of Gas Companies, and the public generally, to an invention which will be a great saving to the community, as they can thereby supply an exceedingly cheap, clear, and brilliant light, besides useful products in profusion. The Works can be seen in successful operation at the Cremorne Gardens, Fourteenth street and Sixth avenue, on application at the office of the Patentee, No. 28 Liberty street, New York, and where any information may be obtained, and where Companies or private individuals wishing to purchase rights for Hotels, Factories, Private Houses, Cities, Counties, or States, will please apply.

WOODEN PURIFYING TRAYS.

PATENT
Conically Slotted Solid Wood Sieves
FOR GAS PURIFIERS.

CAUTION
TO
GAS MANUFACTURERS.

The Conically Slotted Solid Wood Tray was patented 21st October, 1862, by N. O. Hawxhurst, assignee of Wm. Combe, and all persons are cautioned against purchasing such trays of R. G. Hunt, or any other person except the subscriber, as it is a direct infringment of said patent. The following companies are now using these trays.

Manhattan, New York,
Williamsburgh,
Brooklyn,
Albany,
Baltimore,
Philadelphia,
Chicago,
Louisville,
And numerous others.

Orders received by mail or otherwise.
JOHN L. CHEESMAN,
147 Ave. C, New York City.

CLAY RETORTS.

ADDISON POTTER,
WILLINGTON QUAY,
NEAR NEWCASTLE-UPON-TYNE, ENGLAND,
Manufacturer of CLAY RETORTS, FIRE BRICKS, and every description of FIRE CLAY GOODS.

PHILADELPHIA FIRE-BRICK Works, corner of Vine and Twenty-third streets, Philadelphia.
JOHN NEWKUMET,
Manufacturer of all kinds of FIRE-BRICK, GAS-HOUSE TILES, to suit all the different plans in use. Clay Retorts and Dentists' Muffles. Orders filled at short notice.

IRON FOUNDRIES.

MORRIS, TASKER & CO.,
PASCAL IRON WORKS,
[ESTABLISHED 1821.]
PHILADELPHIA,
Manufacture Wrought Iron Welded Tubes for Gas, Steam or Water; Lap-Welded Boiler Flues, GALVANIZED WROUGHT IRON TUBES,
ARTESIAN WELL PIPES,
of Wrought or Cast-Iron, screwed together, flush inside and out; Gas-works Castings, Retorts and Bench Castings for Coal Gas-works,; Cast-Iron Street Mains, Bends, Branches, Drips, &c.
Gas and Steam Fitters' Tools, &c.
STEPHEN MORRIS,
THOMAS S. TASKER,
CHAS. WHEELER,
STEPHEN M. P. TASKER.

BERGEN IRON WORKS,
Established 1833.
R. A. BRICK, Manufacturer of CAST IRON WATER and GAS-PIPES RETORTS, PIPES, &c., always on hand. Office, 109 Leonard Street, New York.

S. FULTON & CO., (Successors to Colwell & Co.) Manufacturers of Pig Iron and Cast Iron Gas and Water Pipes, also Heavy and Light Castings of every description, No. 207 North Water street and 206 North Wharves, Philadelphia.
SAMUEL FULTON, THEO. TREWENDT.

FLORENCE IRON WORKS.—The subscriber is prepared to execute orders and make contracts for Cast-Iron Water and Gas-Pipes, from 2 inches to 48 inches in diameter; also, Retorts, Bench-Castings, Branches, Bends, and all Castings for Water or Gas-Works. Pipes and Castings coated with Smith's Patent Coal Tar Varnish to prevent corrosion.
JOSEPH G. JONES,
205½ Walnut Street, Philadelphia.

THE ALPHA TUBE WORKS,
WALSALL, STAFFORDSHIRE, ENGLAND,
Established 1830.

LAMBERT BROTHERS,
Manufacturers of
LAP-WELDED BOILER TUBES, LOCOMOTIVE AND MARINE ENGINE FITTINGS,
Wrought Iron Welded Pipe,
FOR STEAM OR HIGH-PRESSURE WATER AND GAS;
HIGH-PRESSURE STEAM AND WATER VALVES,
FIRE & GARDEN ENGINE WORK, PUMPS, HYDRANTS, WATER-CLOSETS.
Iron and Brass Gas-Fittings, Gaseliers, &c.
AND OF THE GROVE BEDSTEAD WORKS, WALSALL.
Delivery Free, in Liverpool, &c.
Catalogues post free.

POOLE & HUNT, BALTIMORE, MD., are prepared to execute orders for
GAS-HOLDERS,
IRON-ROOF FRAMING,
And all other descriptions of
Iron Work for Gas-Works, Water-Pipes, and Heavy Castings, and Machinery generally.

R. D. WOOD & CO.,
MANUFACTURERS OF
CAST-IRON PIPE, RETORTS, &c.
Office, 400 Chestnut Street,
PHILADELPHIA.

J. VAUGHAN MERRICK, W. H. MERRICK,
JOHN E. COPE.

SOUTHWARK FOUNDRY,
FIFTH & WASHINGTON STREETS,
PHILADELPHIA.
MERRICK & SONS, Engineers,
MANUFACTURERS OF EVERY DESCRIPTION OF GAS MACHINERY.
Retorts, Bench Castings, Condensers, Washers, Scrubbers, Wet or Dry Lime Purifiers, Coke Wagons, Fire Tools, Wrought Iron Grate Bars, Gasholders, either Telescopic or Single, with Suspension Frames complete; Wrought Iron Roof Frames, for Iron or Slate; Stop Cocks, Exhausters, Steam Pumps, Boilers and Tanks, Steam or Hand Air Pumps for providing Street Mains, Centre Seals, Governors, Wrought or Cast-Iron Line Sieves for Purifiers, Purifier Hoisting Machines, &c., &c.
Address— MERRICK & SONS,
5th and Washington Streets, Philadelphia.

THE GROVER & BAKER SEWING MACHINE, everywhere triumphant. This Machine has taken the First Premium at the State Fairs last held in

New York,	Missouri,
New Jersey,	Kentucky,
Ohio,	Tennessee,
Indiana,	Virginia,
Illinois,	North Carolina,
Michigan,	Alabama,
Iowa,	California,

Including every State Fair at which it has been exhibited in 1862.

The Work made on the Grover & Baker Machine has taken the First Premium at every Fair in the United States where it has been exhibited to this date. GROVER & BAKER S. M. CO.,
495 Broadway, N. Y.

OUR AGENTS.

AGENTS OF
The American Gas-Light Journal,

From whom it can be purchased in single copies or by the year.

TERMS—$3 per annum. Single copies 15 cents. Liberal discount to Dealers.

ALBANY, N. Y.	Thomas Hastings, P. L. Gilbert, Wm. J. Bell.
BOSTON, Mass.	D. Howard, Jr., Cushing & Bowen.
BRIDGEPORT, Ct.	News Agent at R. R. Station.
BUFFALO, N. Y.	T. G. Hawks, B. F. Felton, D. Lockwood.
CARMANSVILLE, N. Y.	W. Cameron.
CATTSKILL, N. Y.	W. Van Loan.
CHICAGO, Ill.	J. McNally, J. R. Walsh, Shear & Co.
CLEVELAND, O.	Hawks & Bros.
COLDSPRING, N. Y.	A. Tenant.
DOBBS' FERRY, N. Y.	E. Ackerman.
ELIZABETH, N. J.	R. Caldwell, Wm. Gale.
ELMIRA, N. Y.	M. B. Brink.
FALL RIVER, Mass.	L. J. Moroo.
FISHKILL LANDING, N. Y.	J. R. Van Slyke.
FISHKILL VILLAGE, N. Y.	B. Stanbach.
FORT WASHINGTON, N. Y.	J. Maloney.
FRANKLIN, N. Y.	G. W. Reynolds.
GALENA, Ill	G. H. Schenck.
HARTFORD, Ct.	D. C. Pond, C. J. Geer.
HASTINGS, N. Y.	D. Crane.
HINSDALE, Pa.	A. G. Forbes.
HUDSON, N. Y.	G. Parton.
HYDE PARK, N. Y.	J. N. De Graff.
JAMESTOWN, N. Y.	G. W. Hazletine.
KINGSTON, N. Y.	C. Van Buren.
MILBURN, N. J.	W. Hastings.
MORRISTOWN, N. J.	J. West, J. R. Runyon.
NEWARK, N. J.	Agens & Co., J. R. Jillison.
NEWBURG, N. Y.	W. H. Callahan, J. M. Martin, P. C. Daly, G. P. Lomas.
NEW HAVEN, Ct.	E. Downs, T. H. Pease.
NEWPORT, R. I.	B. J. Tilley.
NEWTOWN, N. J.	H. Warren.
NYACK, N. Y.	H. Hazelbarth.
PEEKSKILL, N. Y.	J. A. Green.
PHILADELPHIA, Pa.	V. H. Myers, 152 South Fourth street.
PITTSBURG, Pa.	J. W. Fittock, Henry Miner, L. P. Hunt.
POUGHKEEPSIE, N. Y.	J. H. Bush, W. Patrick, G. Williamson.
PROVIDENCE, R. I.	D. Kimball,
RAHWAY, N. J.	W. H. Neefers.
RONDOUT, N. Y.	A. M. Barbes, Winter Bros.
SARATOGA SPRINGS, N. Y.	A. Hill.
SAUGERTIES, N. Y.	T. J. Barrett.
SING SING, N. Y.	F. Bushers.
SOMMERVILLE, N. J.	C. Barkalow.
STAMFORD, Ct.	G. R. Treate. News Agent at R. R. Station.
ST. JOHNSVILLE, N. Y.	G. A. Russell.
SYRACUSE, N. Y.	J. H. Green.
TARRYTOWN, N. Y.	C. De Riviere.
TOLEDO, O	L. C. Shear.
TROY, N. Y.	L. Willard, J. F. Hoyt.
WASHINGTON, D. C.	Frank Taylor, P. De Vine, Kirkwood House, News Agent Willard's Hotel.
WATERBURY, Ct.	D. J. Bishop.
WELLSVILLE, N. Y.	Wm. Patton.
WEST POINT, N. Y.	H. N. Sheerar, R. A. Grand, opposite West Point.
YONKERS, N. Y.	D. Burns, John Featherstone.

General Agents in New York City.

ROSS & TOUSEY, 121 Nassau Street.

H. DEXTER & CO., 113 Nassau Street.

OKIE, DAYTON & JONES, cor. Ann and Nassau Sts.

L. N. SHEAR & CO., 55 Hudson Street.

HAMILTON, JOHNSON & FARRELLY, 22 Ann Street.

J. F. FEEKS & CO., 24 Ann Street.

F. S. THOMSON, New Haven Railroad Station, 27th Street.

THOMAS FITZGIBBONS, New Jersey and Amboy Railroads.

ALEXANDER CRAW, Harlem Railroad Station, 26th Street.

WM. SKELLY, Greenwich Street, Erie Railroad Station, Duane Street.

In Canada.

THE AMERICAN GAS-LIGHT JOURNAL can be ordered through any of the News Agents in either of the Canadas.

In Great Britain.

Terms 12s. per annum, single copies 10d.
TRUBNER & CO., 60 Paternoster Row, London.

In France.

Terms 15 Frs. per annum.

Bureau of *Le Journal de l'Eclairage au Gas*, Boulevard de Poissonniere, No. 24, Paris.

ROOMS IN NEW YORK.—No. 39 Nassau Street, opposite the Post Office.
Terms—$3 per annum. Single copies 15 cents.

THE AMERICAN METER COMPANY,

Organized under the General Manufacturing Laws of the State of New York.

SAMUEL DOWN, President. HENRY CARTWRIGHT, Vice-President.
RICHARD MERRIFIELD, Secretary and Treasurer.

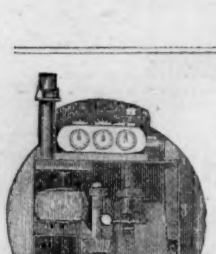
Trustees.

SAMUEL DOWN, WILLIAM HOPPER, R. H. GRATZ, HENRY CARTWRIGHT, RICHARD MERRIFIELD.
THOMAS C. HOPPER, *Superintendent at Philadelphia.*

This Company is now prepared to furnish WET AND DRY GAS METERS, STATION METERS, GOVERNORS, PRESSURE INDICATORS and REGISTERS, SERVICE and METER COCKS, and all other articles in their line appertaining to the use of Gas-Works.

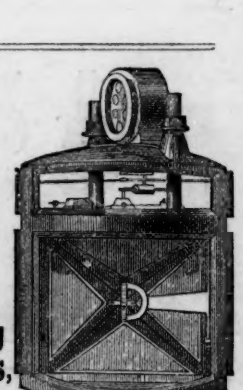
The combination of Mechanical and Scientific Skill, and the long experience of the several members of the Company, is a sure guarantee of durability, accuracy, and excellence of workmanship. Orders addressed

AMERICAN METER COMPANY,
340 WEST TWENTY-SECOND STREET, NEW YORK,
1504 FILBERT STREET, PHILADELPHIA,
23 & 25 BROMFIELD STREET, BOSTON,
Will meet with prompt attention.



HARRIS & CO.,

(LATE HARRIS & BRO.,)
N. W. CORNER 13TH & CHERRY STREETS,
PHILADELPHIA,
MANUFACTURERS OF
WET AND DRY GAS-METERS,



METER PROVERS, CENTRE SEALS, PHOTOMETERS, GOVERNORS, STATION METERS,
EXPERIMENTAL METERS, PRESSURE REGISTERS, PRESSURE GAUGES, &c., &c.

The firm of Harris & Co., which comprises the senior partner and only practical Meter maker of the late firm of Harris & Bro., will continue the manufacture of Meters, &c., of every description, and will guarantee to furnish an article of Meters equal to the best in the country, at the lowest rates, and combining the latest improvements with great durability and accuracy. The reputation of the Meters of the late firm of Harris & Bro. is confidently appealed to. All our Meters are tested by a sworn Inspector. Terms Easy.

HARRIS & BROTHER,
PRACTICAL GAS METER MANUFACTURERS,

Continue, as heretofore, at their old Establishment,
No. 1117 CHERRY ST., PHILADELPHIA,
TO MANUFACTURE
WET AND DRY GAS METERS (Consumers'),
STATION, EXPERIMENTAL AND SHOW METERS,
GLAZED METERS, METER PROVERS, AND PHOTOMETERS,
GOVERNOR AND CENTRE SEAL DRUMS,
FLUID AND PRESSURE GUAGES,
PRESSURE REGISTERS AND INDICATORS, &c., &c., &c.
All our work warranted. All orders addressed to
HARRIS & BRO., 1117 Cherry Street, Philadelphia.

PRINCE'S METALLIC PAINT,

AN INDESTRUCTIBLE COATING FOR
IRON, TIN, and WOOD.

It consists of seventy-two parts Oxide of Iron, and twenty-eight parts Cement Lime Stone in the one hundred pounds.

It has much more body than red or white lead. It is warranted perfectly water and fire-proof and to withstand a greater heat on metals, without scaling, than any other paint in use.

It is a perfect cover for all kinds of iron, tin, or wood-work, out-houses, and canvas coverings. It prevents and arrests the corrosion of metals, and is not affected by the action of salt, gases, acids or ammonia.

It hardens under water, as has been fully demonstrated by its application to gas-holders, by many of the largest gas companies in the United States; which companies having thoroughly tested its properties as herein claimed, pronounce in its favor over any other paints in the market, even though sold at double its price.

As a coating for patterns of iron or wood, when mixed with shellac, it is much superior to beeswax, oil, or shellac alone, as has been proven at the large founderies in the country.

For patching boilers and making joints, it is considered superior to red lead, or any other preparation.

For cleaning metals it takes the place of crocus, rouge, and emery, being better and cheaper.

This Paint requires no more oil than dry lead or zinc, and much less than the ordinary mineral paints. It is free from any waste, and possesses a spreading and covering power unequaled.

Terms, by the Barrel or Half Barrel, Four Cents per Pound.

A liberal discount made to parties purchasing by the ton.

A Barrel or Ton will be forwarded to any gas companies desirous of testing its qualities, for which there will be no charge if it does not give entire satisfaction as being the cheapest and most durable of all other Paints in the market.

DANIEL SLOAN, General Agent,
71 Maiden Lane, New York.

Local Agents—S. R. Williams, 204 South Front st., Philadelphia.
Calvin Gay, 81 State st., Boston.

BOOKS FOR GAS ENGINEERS.

A Treatise on Gas-Works and the Practice of Manufacturing and Distributing Coal-Gas. By Samuel Hughes, Civil Engineer.

Gas Legislation, being a copious Index to the Metropolis Gas Act of 1860. By Samuel Hughes, C. E.

Report of the Proceedings of Both Houses of Parliament on the Metropolitan Gas Bill.

The Chemistry of Gas-Lighting. By Lewis Thompson, Consulting Chemist.

A few copies of the above books, invaluable to gas engineers, are for sale at the Rooms of the American Gas-Light Journal, No. 39 Nassau st., New York City.

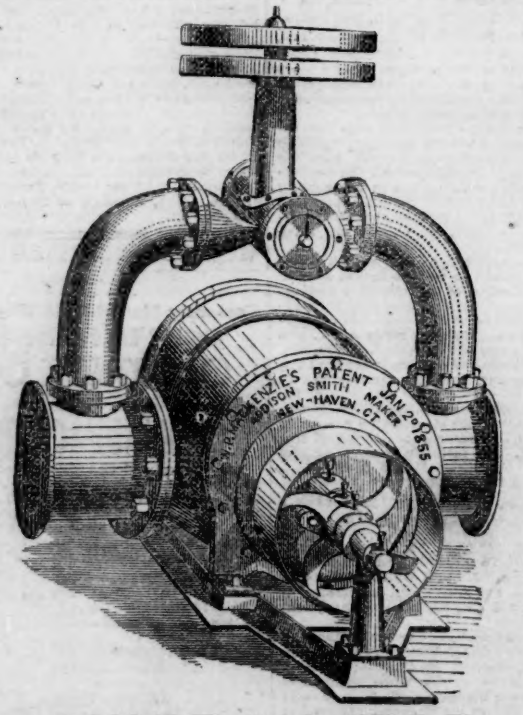
Gas Engineers who may want any scientific books will be promptly supplied at publisher's prices, by sending their orders, accompanied by the money, to this office.

NEW YORK FIRE-BRICK Manufactory. (Branch Works at Kreischerville, Staten Island.)

B. KREISCHER & CO., office 56 Goerck street, corner Delancy street, New York.

Gas-House Tiles and Fire-Brick of all shapes and sizes. Fire Mortar, Clay, and Sand articles of every description made to order at the shortest notice. B. Kreischer, M. Maurer, A. Weber.

THE AMERICAN
PETROLEUM COMPANY,
OF THE CITY OF NEW YORK,
No. 10 Pine Street.
W. W. CLARKE,
Vice-President.



SMITH & SAYRE,

Sole Proprietors and Manufacturers of
THE MACKENZIE PATENT GAS EXHAUSTER
AND
PATENT COMPENSATOR.

They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the production and illuminating power of the gas, and add very much to the durability of the retorts, either clay or iron. The Compensator obviates entirely the necessity of water-joints, is compact, durable, cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

We are also sole proprietors and manufacturers of the
MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durably built, and can be driven with one-third the power required to drive the ordinary Fan. The Cupolas are manufactured in sizes to melt from 1 ton to 20 tons per hour, will save one quarter of the time required by the old style Cupola, and 33 per cent. fuel Address
SMITH & SAYRE, 458 Broadway, New York.

NEWSPAPER WRAPPERS. Mara's Patent Self-Sealing and Folding Water-lined Newspaper Wrappers, $1.50 per 1000. Sold by F. W. BOND,
Sole Agent for the Patentee,
58 Liberty st., New York.

A. CARR, Manufacturer and Dealer in Wrought and Galvanized IRON PIPE, BRASS COCKS, VALVES, &c., &c., and all descriptions of FITTINGS FOR STEAM, WATER and GAS,
135 MERCER STREET, New York.